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LONDON:

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A HISTORY  
OF THE  
SPIDERS  
OF  
GREAT BRITAIN AND IRELAND.

BY  
JOHN BLACKWALL, F.L.S.

"CUM AUTEM PLERAQUE, QUÆ HIC HABENTUR, AD FIDEM SENSUS REFERRI POSSINT, IN ID MAXIMÈ INCUBUI, NE IPSE PRIMUM DECEPTUS, POSTEROS IN ERROREM DUCEREM. SUMMAM SANÈ DILIGENTIAM ADHIBUI, UT VERAS SPECIES DISTINGUENDO, NON MULTIPLICANDO CITRA NECESSITATEM, SINGULAS, MINUTISSIMIS LICET, FIDISSIMIS TAMEN OBSERVATIONIBUS, QUÆ AD ANIMALIUM MORES VITAMQUE SPECTARENT, EXORNAREM."

LISTER, *Hist. Animal. Angl.*, ad lectorem, p. 2.

LONDON:  
PUBLISHED FOR THE RAY SOCIETY BY  
ROBERT HARDWICKE, 192, PICCADILLY.

MDCCCLXI.



PRINTED BY J. E. ADLARD,  
BARTHOLOMEW CLOSE.



## P R E F A C E.

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OUR celebrated countryman, Dr. Martin Lister, in his admirable 'Tractatus de Araneis,' has given a classification of the species he has so ably described, founded on their external organization and economy, which has formed the basis of every subsequent attempt, deserving of notice, to effect a systematic arrangement of this interesting order of animals.

Since the publication of Dr. Lister's treatise in 1678, little attention has been bestowed upon the natural history of spiders in this country, till within the last thirty years; and we are indebted for almost every advance which has been made in it during that long interval of time to the talent and industry of the continental zoologists, particularly those of France, Sweden, and Germany.

Under these circumstances, it is hoped that the present imperfect endeavour to supply that desideratum in the zoology of Great Britain, a history of our indigenous spiders, adapted to the existing state of arachnological science, will be regarded with due consideration for the numerous and great difficulties by which the undertaking is surrounded.

Although a large addition has recently been made to the knowledge of our native species of *Araneidea*, yet the subject is far from being exhausted; a wide field still remains to be explored by succeeding arachnologists; and if the present work should tend to promote and facilitate the researches of others in this department of zoology, one of the most important purposes which it is intended to subserve will be accomplished.

In taking the dimensions of spiders, it is desirable that the relative length of their legs should be ascertained with exactness; and this object may be conveniently attained by submerging the specimens to be examined in spirit of wine till life is extinct; then, on removing them to a piece of white cardboard and carefully extending the limbs with a pin, while they are pliable, their extent, from the margin of the cephalo-thorax to their extremity, may be taken with a pair of compasses, which on being applied to a scale of inches and parts will give their measurement. The length of species is determined by measuring them from the anterior part of the cephalo-thorax to the extremity of the abdomen, not including the falces and spinners.



When exceedingly minute spiders are made the subjects of investigation, it is essential that the sexual organs should be closely inspected, as they afford, by their complete development, an infallible criterion that the animals have arrived at maturity; they also present, by their greatly diversified organization, particularly as regards the males, in which sex they are connected with the digital or terminal joint of the palpi, excellent specific characters, the value of which will be duly appreciated when it is recollected that many species so nearly resemble each other in size and colour as to be distinguished by differences in structure only.

The difference in the number of eyes with which spiders are provided, supplying, as it does, well-marked characters not difficult to be ascertained, has been taken as the most convenient and satisfactory basis of their distribution into tribes. On this principle the three following tribes have been founded, which include all the species hitherto discovered:

1. Octonoculina; eyes eight.
2. Senoculina; eyes six.
3. Binoculina; eyes two.

The first tribe, *Octonoculina*, is much the most extensive of the three, comprising numerous genera, which exhibit considerable differences in organization and economy; the second tribe, *Senoculina*, includes ten or eleven genera, species belonging to many of which are found in this kingdom; and the third tribe, *Binoculina*, contains the single genus *Nops*, instituted by Mr. W. S. MacLeay for the reception of two remarkable species of extra-European spiders. It may be further remarked, that to the families previously established another has been added, namely, the *Ciniflonidæ*; and that several new genera have been introduced, whose characters are defined in their appropriate places.

In preparing the following pages for publication, the principal authorities consulted were Lister, Latreille, Walckenaer, Sundevall, Hahn, Koch, Wider, Dugès, Audouin, Owen, &c., from whose writings much valuable information has been derived.

It remains to acknowledge the kind assistance of friends from whom specimens have been received; but as the obligations to each will be expressed as suitable occasions present themselves, it is not requisite to allude to them more particularly in this place.



## INTRODUCTION.

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LINNÆUS and the naturalists of his school have included spiders in the extensive class *Insecta*, having constituted with them the genus *Aranea*, comprised in the order *Aptera*. Subsequently, zoologists have removed the *Araneæ* and several nearly allied groups from the apterous insects, and have established with them the class *Arachnida*. Of this class the spiders form the order *Araneidea*, which is divided into tribes, families, and genera. A concise summary of the more important facts relating to the organization and economy of these animals, which have been disclosed by the researches of anatomists and physiologists, will serve to elucidate the history of species.

Spiders, with few exceptions, have a cephalo-thorax, or the head continuous with the chest; but the cephalic may readily be distinguished from the thoracic portion by the presence of the eyes, which are two, six, or eight in number; by the falces,<sup>1</sup> situated in front, and terminated by a pointed fang which has a ginglymoid movement; and by the oral apparatus connected with its inferior surface. The parts of the mouth consist of two maxillæ, each provided with a palpus of five joints, having between them a sternal labium, and above them a palate to whose superior surface a small labrum is attached. Eight legs, of seven joints each, having two or more claws at their extremity, are articulated round the cephalo-thorax, to the posterior part of which the abdomen is united by a short, cartilaginous pedicle. The abdomen is moveable, without division, terminated by a small, angular process, which covers the anal orifice, and by four, six, or eight fleshy mammulæ, placed directly below the anus, from which the silk proceeds in the act of spinning. On the under side of the abdomen, near its anterior extremity, there are two or four respiratory apertures or stigmata; and in the middle of the space which separates them the external foramen of the sexual organs is situated in the females, but in the males these organs are connected with the terminal joint of the palpi; consequently, they are double.

The cephalo-thorax is covered on the upper part with a plate, which is generally coriaceous, but in some instances is hard and corneous. It varies considerably in figure, the

<sup>1</sup> The term *falces* is applied to the organs improperly denominated mandibles, which, being situated above the labrum, form no part of the oral apparatus. See the 'Transactions of the Linnean Society,' vol. xxi, p. 37.



prevailing forms being oval, cordate, and quadrilateral. The anterior region, where the eyes are situated, is frequently elevated, and is sometimes tuberculated. The covering of the inferior portion of the cephalo-thorax, or sternum, likewise consisting of a coriaceous plate, is oval, circular, or cordate. It is scalloped on the lateral margins, and often presents small eminences opposite to the articulation of the legs. Both these parts are densely clothed with hairs in some species, but in others they are almost entirely without hairs, smooth, and glossy.

All spiders at present known have two, six, or eight smooth eyes, which vary much in size and relative position, supplying characters of great importance in the systematic arrangement of species.

The falces, inserted immediately under the anterior margin of the cephalo-thorax, though modified in form, are, for the most part, subconical; and have usually at the extremity of their inner surface a longitudinal groove provided with sharp teeth on the sides, which receives the fang when in a state of repose. The fang is very hard, curved, acute, and has a small fissure near the point, which emits a colourless fluid secreted by a gland. These instruments are either glabrous, or covered more or less with hairs, and are sometimes armed with sharp, corneous points, particularly at the extremity, near the insertion of the fang.

Spiders belonging to the family *Mygalidæ* have the falces articulated horizontally, their movement being vertical; the falces of those included in the other families being articulated vertically, or on an inclined plane, and their principal movement lateral, with the exception of a few species whose falces are united.

The maxillæ and the sternal lip are directed forwards, or inclined downwards in all spiders. The former are hairy at the extremity, which is round, obliquely truncated, or pointed. Their configuration and their position in relation to the sternal lip, together with the form of the latter, furnish excellent generic characters.

Connected with the maxillæ are the palpi, which project on each side of the falces. They consist of five joints supplied with hairs and spines, and are, for the most part, terminated by a curved, pectinated claw in female spiders. The first, or axillary joint, is short; the second, or humeral joint, is long; the third, or cubital joint, is short; the fourth, or radial joint, which is rather long in the females, is usually short in the males, and, in the latter sex, is frequently provided with one or more corneous apophyses; the fifth, or digital joint, varies in length; but in the males it is commonly short, oval, and dilated, having the sexual or palpal organs attached within and partially concealed by a cavity on its under side. These latter organs, composed of soft, membranous, vesicular parts, susceptible of tumefaction, exhibiting on their external surface, or at their extremity, various curved, corneous processes, are complicated in structure and greatly diversified in form, indicating by their complete development a state of maturity.

Much variety is observable in the figure of the sternal lip, which, as its name implies, is connected with the sternum; the prevailing forms are oval, semicircular, quadrilateral, and triangular. In the greater number of spiders this part is glabrous. Between the sternal lip and falces the palate is situated, whose hairy extremity alone is visible in its natural position.

The legs, disposed round the cephalo-thorax, are composed of a haunch of one joint; a thigh and a shank, each formed of two joints; and a foot, also divided into two joints; except

in the species belonging to the genus *Hersilia*, which have the foot divided into three joints. The haunch, or coxa, is articulated with the cephalo-thorax. The first part of the thigh, or the exinguinal joint, is short, and is closely united to the haunch; the second part, or the femoral joint, being long. The first part of the shank, or the genual joint, is usually short, and is closely united to the second part, or the tibial joint, which is long. The parts of the foot are the upper or metatarsal joint, and the lower or tarsal joint, which latter is almost always terminated by two or more claws. Two of these claws, inserted one beside the other, are in general curved, and pectinated, and immediately below them another frequently occurs; it is small, and abruptly inflected near the base, where a pair or two of minute teeth may sometimes be perceived. When the last claw is not present, a scopula or brush, consisting of coarse, compound, hair-like papillæ, often occupies the inferior surface, or the extremity of the tarsi. Closely analogous to the tarsal cushions of insects in the function it performs, this apparatus enables its possessor to ascend hard dry bodies having highly polished, perpendicular surfaces, by the emission of a viscous secretion.<sup>1</sup>

In addition to the claws already described, some spiders have several small, dentated ones on the sides and lower part of the tarsi, at their extremity. This is the case with the *Epëiræ* in particular; they have also a strong moveable spine, inserted near the termination of the tarsus of each posterior leg, on the under side, which curves a little upwards at its extremity, and exhibits a slight irregularity of outline at its superior surface. These spines, which have been denominated *sustentacula*, subserve an important purpose. By the contraction of their flexor muscles they are drawn towards the foot, and are thus brought into immediate opposition to the claws, by which means the animals are enabled to hold with a firm grasp such lines as they have occasion to draw from the spinners with the feet of the hind legs, and such also as they design to attach themselves to.<sup>2</sup>

Like the palpi, the legs are provided in a greater or less degree with hairs and spines; and some spiders, *Ciniflo atrox* and *Ergatis benigna*, for example, have on the superior part of the metatarsal joint of each posterior leg two parallel rows of moveable spines forming a curling apparatus, employed in the construction of their snares. This apparatus has received the name of *calamistrum*.<sup>3</sup> The relative length of the legs presents much diversity, and is not always alike even in the sexes of the same species.

In much the greater number of spiders, the abdomen, attached to the cephalo-thorax by a short pedicle, is enveloped in a soft, continuous skin, covered more or less with hairs; but in some species its covering is of a hard, corneous consistency. The predominant forms of the abdomen are ovate, cylindrical, and subglobose, variously modified; and its figure is still further diversified in some species by fleshy tubercles and corneous spines. On its upper part or back it frequently exhibits divers colours, arranged according to numerous designs, which greatly contribute to the distinction of species.

Placed immediately below the anus are the spinning-mammulæ; they are four, six, or eight in number, conical or cylindrical in figure, composed of one or more joints each, and are

<sup>1</sup> 'Transactions of the Linnean Society,' vol. xvi, pp. 768, 769. 'Researches in Zoology,' p. 289. 'Annals and Magazine of Natural History,' vol. xv, pp. 115-118.

<sup>2</sup> 'Transactions of the Linnean Society,' vol. xvi, p. 476; vol. xviii, p. 224, note.

<sup>3</sup> Ibid., vol. xvi, pp. 471-475; vol. xviii, pp. 224, 606.



closely grouped in pairs, readily distinguished from each other by their relative positions. The pair situated nearest to the anus may be denominated the superior spinners; that furthest removed from the anus, the inferior spinners; and the mammulæ placed between these extremes, the intermediate spinners; distinguishing them, when there are two pairs, by prefixing the terms superior and inferior. Fine, moveable papillæ, differing in size in the same individuals, are situated at the extremity, or distributed along the inferior surface of their terminal joint, whence issues the viscous secretion of which the silken lines produced by spiders are formed.<sup>1</sup>

The superior pair of spinners, when triarticulate and considerably elongated, has been mistaken by Treviranus and other skilful zootomists for anal palpi. This singular error may be attributed to the peculiar disposition which the papillæ, or spinning-tubes, connected with the superior mammulæ, when thus modified, commonly exhibit. Arranged along the under side of the terminal joint, they present the appearance of slender hairs dilated at the base; but if the spinners, when they are in operation, be carefully examined with a powerful magnifier, the function of the hair-like tubes may be ascertained without difficulty, as the fine lines of silk proceeding from them will be distinctly perceived. The purpose subserved by the superior mammulæ, when very prominent and composed of several joints, is the binding down with transverse lines, distributed by means of an extensive lateral motion, the threads emitted from the inferior mammulæ; by which process a compact tissue is speedily fabricated.<sup>2</sup>

On the under part of the abdomen, near its anterior extremity, there are two or four either slightly pubescent or naked plates of a whitish, yellowish, or brownish hue, having at their posterior margin a narrow, transverse orifice or stigma, communicating with the organs of respiration. In the space intermediate between these plates the external aperture of the sexual organs is situated in female spiders. It is fully developed in the adult state only.

The internal organs of respiration in connexion with the anterior pair of stigmata present the appearance of membraneous sacs formed by lamellæ applied to one another like the leaves of a book; each of these little receptacles opens into a common cavity, the membraneous margins of which adhere to a cartilaginous arc connected with the branchial operculum. These organs are common to all spiders, and, from the important function they perform, may be termed pulmonary branchiæ. The posterior pair of stigmata occur much less frequently, and in communication with them there are numerous tracheæ which radiate to the surrounding parts.

An elongated, fusiform vessel, whose office is analogous to that of the heart in animals of a higher order, extends along the middle of the superior region of the abdomen, immediately beneath the integument, on which account it has been named the dorsal vessel. An artery is continued from both its extremities, and the colourless blood, which is returned to it by several veins on each side, is propelled forwards by the contraction of its muscular walls.

The alimentary canal communicates with the mouth, between the maxillæ, by a short, slender œsophagus of a delicate texture, terminating in the stomach, which is placed in the posterior part of the cephalo-thorax. The digestive tube then continues as a straight narrow

<sup>1</sup> 'Transactions of the Linnean Society,' vol. xviii, pp. 219-224.

<sup>2</sup> 'Researches in Zoology,' p. 298, *et seq.*

canal, of moderate length, which dilates and adheres by its parietes to a kind of epiploon, filled with adipose granules, situated in the abdomen. Posteriorly the dilated part becomes stronger in texture, insensibly contracts, and then undergoes a second dilatation before it opens into the rectum.

Spiders employ their falces to seize, kill, and retain the insects that they prey upon, and their maxillæ to masticate them and to express their fluids, which, when mingled with the liquid contents of the stomach, previously propelled into the mouth through the minute pharyngeal aperture, they swallow. Though extremely voracious, they are capable of enduring long abstinence from food, a female *Theridion quadripunctatum* having been known to exist for eighteen months without nutriment in a phial closely corked.<sup>1</sup> When affected by thirst they will drink water freely. Their fæces consist of a white liquid containing oval, black particles of a greater degree of consistency.

It has been already remarked that the aperture of the generative organs is situated between the branchial opercula in female spiders. At this part, which is often provided with opercular pieces of a more or less solid texture, the oviducts terminate. In the house spider, *Tegenaria domestica*, these oviducts are continued internally in an insensible manner with the ovaries, which form on each side of the intestinal canal a kind of sac, to whose parietes the ova are attached in a racemose manner. In the diadem spider, *Epëira diadema*, each ovary is divided by a transverse septum, and the eggs are laid at distinct periods.

With regard to the function exercised by the remarkable organs connected with the digital joint of the palpi of male spiders there exists some difference of opinion. Taking anatomy as his guide, Treviranus arrived at the conclusion that the parts in question are used for the purpose of excitation merely, preparatory to the actual union of the sexes by means of appropriate organs situated near the anterior part of the inferior region of the abdomen. This view of the subject, which is very generally adopted, is opposed to that derived from physiological facts by Dr. Lister and the earlier systematic writers on arachnology, who regarded the palpal organs as strictly sexual, and recent researches, conducted with the utmost caution, have clearly established the accuracy of the opinion advanced by our distinguished countryman.<sup>2</sup>

There are in the posterior part of the abdomen of spiders special organs for the secretion of the viscous matter of which their silken lines are formed. These consist of intestinform vessels, varying in number and extent in different species, and having near their base, not far from the point where they open into the spinning-mammulæ, some small, supplementary canals. When issuing from the minute papillæ connected with the mammulæ, the viscous fluid hardens immediately on exposure to the action of the air, forming delicate filaments, which vary greatly in number in different species. Those of each mammula unite in the first instance, and then the whole combine to form a common thread; so that the lines which serve such important purposes in the economy of spiders are composed of numerous filaments of extreme tenuity.

The nervous system in spiders is ganglionic. A bilobed ganglion, situated in the anterior

<sup>1</sup> 'Researches in Zoology,' pp. 302, 303.

<sup>2</sup> 'Report of the Fourteenth Meeting of the British Association for the Advancement of Science,' pp. 67-69.



part of the cephalo-thorax, constitutes the brain, and sends forward nerves to the eyes and falces. The narrow œsophagus is inclosed by a short and thick collar, which expands into a large thoracic ganglion, having small, conoid projections at its sides, from whose apices nerves are distributed to the legs and palpi; and a double, longitudinal, nervous chord, extending from the thoracic ganglion into the abdomen, has its extremity dilated, and from this enlargement a great number of nerves pass off to the organs contained in the abdominal cavity.

Comprised within the cephalo-thorax, to whose integuments they are firmly attached, are the muscles which give motion to the legs, falces, maxillæ, and palpi.

Nothing is known with certainty concerning the organs of smell and hearing in spiders. As regards taste, the choice which these animals make of their food sufficiently indicates that it exists, and it is probable that the organ is situated at the entrance of the pharynx. Numerous circumstances tend to prove that spiders are endowed with considerable delicacy of touch, but the instruments more especially adapted to bring them into relation with surrounding objects are the legs and palpi. The presence of eyes, which are of the kind termed simple, in opposition to those of insects and crustaceous animals, which are denominated compound, leaves no doubt relative to the sight of spiders, though, in all probability, they see objects distinctly at short distances only.

When spiders are about to deposit their eggs they usually spin silken cocoons for their reception, which exhibit much diversity of form, colour, and consistency, and are placed in various situations, according to the economy of the species by which they are fabricated. Many spiders abandon their cocoons so soon as they are completed; others manifest great attachment to them, watching over them with the utmost solicitude; and some, connecting them with the spinners by silken lines, or grasping them with the falces and palpi, transport them wherever they move. In numerous instances the eggs are agglutinated together into a compact mass; in others they are united by filaments of silk; and not unfrequently they are entirely free or unconnected. Their figure is either spherical, or somewhat elliptical; and their predominant colours are yellowish-white, yellow, orange-yellow, brown, and pink. Several sets of prolific eggs are frequently laid in succession, an interval of many months occasionally intervening between the extramission of two consecutive sets, by females which have not associated with males of their species after they have deposited the first set; but eggs produced without sexual intercourse are always sterile. For a knowledge of the various changes which take place in the ova of spiders previously to the extrusion of the young we are indebted to M. Herold,<sup>1</sup> whose highly interesting and important observations may be consulted with advantage by physiologists. The exterior covering of the egg consists of a very delicate membrane, in whose composition no pore or fibre has been perceived. Within this membrane there is a liquid in which several essential parts may be distinguished corresponding to the vitellus, the albumen, and the cicatricula in the eggs of birds.

On the disengagement of young spiders from the egg, every part is enclosed in a membranous envelope; they are embarrassed in their movements, are unable to spin or to seize their prey, and seem to be indisposed to action. For the unrestrained exercise of these functions it is requisite that they should extricate themselves from the covering which impedes them; and this operation, or, as it may be termed, their first moult, occurs after a period

<sup>1</sup> 'De Generatione Araneorum in ovo,' folio, Marburg, 1824.

whose duration is regulated principally by the temperature and moisture of the atmosphere. The moult invariably takes place in the cocoon or general envelope of the eggs, and the young spiders do not quit this common nest till the weather is mild and genial. They then commonly disperse; but the young of some species continue to live together for a considerable time, and in many instances are supplied with sustenance by the mother. On deserting the cocoon the *Lycosæ* attach themselves to the body of their parent, who carries them with her till they are able to provide for themselves.

Before they arrive at maturity spiders change their integument several times; the manner in which these moults are effected may be illustrated by describing the proceedings of an individual of the species *Epëira calophylla*. Preparatory to casting its integument, this spider spins some strong lines in the vicinity of its snare, from which it suspends itself by the feet and a filament proceeding from the spinners. After remaining for a short time in this situation, the coriaceous covering of the cephalo-thorax gives way laterally, disuniting at the insertion of the legs and falces; the line of separation pursues the same direction till it extends to the abdomen, which is next disengaged; the extrication of the legs being the last and greatest difficulty the spider has to overcome. As the suspensory filament connected with the spinners of the exuviae is considerably shorter than the legs, and does not undergo any sensible alteration in length, the abdomen, during the process of moulting, becomes gradually deflected from its original horizontal direction till it assumes a vertical position nearly at right angles with the cephalo-thorax. By this change of posture, attended with numerous contortions of the body, and alternate contractions and extensions of the limbs, the spider is ultimately enabled to accomplish its purpose. When it has completely disengaged itself from the slough, it remains for a short period in a state of great exhaustion, suspended solely by a thread from the spinners connected with the interior of the abdominal portion of the cast skin, which is much corrugated. After reposing a little, the spider further attaches itself to the suspensory lines by the claws of the feet, and when its strength is sufficiently restored, and its limbs have acquired the requisite degree of firmness, it ascends its filaments and seeks its retreat.<sup>1</sup>

Recent investigations have established the fact that the number of times spiders change their integument before they become adult is not uniformly the same as regards every species, *Epëira calophylla* having been observed to moult five times, and *Tegenaria civilis* nine times, from the period of their extrication from the egg till they arrived at maturity, and young spiders infested by the larva of *Polysphincta carbonaria*, an insect belonging to the family *Ichneumonidæ*, which feeds upon their fluids, never moult.<sup>2</sup>

Like animals of the class *Crustacea*, spiders possess the property of reproducing such limbs as have been detached or mutilated, and this curious physiological phenomenon is intimately connected with the renovation of the integument, for legs, palpi, and spinners, which have been amputated are observed to be restored, and afterwards to have their dimensions enlarged, at the period of moulting only.<sup>3</sup>

<sup>1</sup> 'Transactions of the Linnean Society,' vol. xvi, pp. 482-484.

<sup>2</sup> 'Report of the Fourteenth Meeting of the British Association for the Advancement of Science,' pp. 70, 71.

<sup>3</sup> Ibid., pp. 71-74.



The dimensions of reproduced limbs are in inverse ratio to the extent of the injury previously inflicted on the parts; thus, palpi and legs detached at the axillary joint and coxa are usually symmetrical, but diminutive, when reproduced; while those amputated at the articulation of the digital with the radial joint, and near the middle of the tibia or of the metatarsus, on being restored are always very much larger and unsymmetrical; in point of fact, the development of the new limb depends upon the capacity of the undetached portion of the mutilated part; for if a leg be amputated near the middle of the metatarsus, the coxa, femur, and tibia will be of the same dimensions as those joints of the corresponding leg on the opposite side, but the metatarsus and tarsus will be very diminutive; should the excision be made near the anterior extremity of the tibia, then the size of the coxa, femur, and genual joint will be normal, but that of the tibia, metatarsus, and tarsus will be very abnormal. These curious results plainly demonstrate, that not only reproduced limbs in their totality, but that particular joints also, are limited in their dimensions by the capacity of the undetached portion of the mutilated part in which they are developed, and that restored legs and palpi are never symmetrical except when developed in the undetached coxa and axillary joint respectively.

At the penultimate moult of male spiders the digital joints of the palpi become very tumid, in much the greater number of species, by a sudden and rapid advance towards development in the sexual organs, and should these parts be detached during the interval which elapses between that and the succeeding moult, though the palpi, indicating by their organization that the animal has arrived at maturity, may be reproduced, yet the sexual organs are always absent; but when palpi, which had been amputated before the penultimate moult, are reproduced, the sexual organs, perfect in structure, are reproduced also.

If a leg of an immature *Tegenaria civilis* be detached at the coxa four or even six times consecutively, it may be restored at each succeeding moult the spider undergoes, and this frequent renewal of the same part seems to warrant the conclusion that a reproduction of the limbs of the *Araneidea* generally, irrespective of mutilation, actually occurs whenever a change of integument takes place.

Sometimes the stump only of a partially amputated leg is produced at the succeeding moult, especially when the injury has been inflicted but a short time previously to the change of integument, and as the formative process in this case must have made considerable progress before the excision of the part was effected, there is nothing extraordinary in the result; but it is deserving of notice that a similar consequence occasionally ensues when the partial amputation of a leg takes place very soon after a change of integument, before the formative process can be supposed to have commenced.<sup>1</sup>

Little appears to have been done for the purpose of determining the longevity of spiders with some approach to accuracy; that of many species evidently does not exceed the brief space of twelve months; others enjoy a more prolonged term of existence; and the life of *Tegenaria civilis* and *Segestria senoculata* has been ascertained to extend through a period of four years.<sup>2</sup>

Anomalies in structure may sometimes be observed among spiders, especially as regards the number and size of the eyes, but they seem scarcely to have engaged the attention of

<sup>1</sup> 'Annals and Magazine of Natural History,' second series, vol. i, pp. 176, 177.

<sup>2</sup> Ibid., i, p. 178.

arachnologists; this is the more extraordinary as the number, disposition, and relative size of the organs of vision constitute important elements in the classification of the *Araneidea*.<sup>1</sup>

Under the guidance of their respective instincts, a high degree of skill and industry is displayed by spiders in the construction of their retreats. Many species occupy holes formed by themselves beneath the surface of the earth, some of which, of a cylindrical shape; are lined with a compact tissue of silk, and have the entrance closed by a valve provided with a hinge, which can be opened and shut at pleasure. Other species fabricate in the crevices of walls, the crannies of rocks, beneath stones, on the leaves of vegetables, and under the exfoliating bark of trees, tubes, cells, or domes of silk, on whose exterior surface soil, minute pebbles, and other heterogeneous materials are frequently distributed. *Theridion riparium* fabricates a slender, conical tube of silk, of a very slight texture, measuring from one and a half to two and a half inches in length, and about half an inch in diameter at its lower extremity. It is closed above, open below, thickly covered externally with bits of indurated earth, small stones, and withered leaves and flowers, which are incorporated with it, and is suspended perpendicularly, by lines attached to its sides and apex, in the irregular snare constructed by this species. In the upper part of this singular domicile the female spins several globular cocoons of yellowish-white silk, of a slight texture, whose mean diameter is about one eighth of an inch, in each of which she deposits from twenty to sixty small, spherical eggs, of a pale, yellowish-white colour, not agglutinated together. The young remain with the mother for a long period after quitting the cocoons, and are provided by her with food, which consists chiefly of ants.<sup>2</sup>

Various spiders run fearlessly on the surface of water, and some even descend into it spontaneously, the time during which they can respire, when immersed, depending upon the quantity of air confined by the circumambient liquid among the hairs with which they are clothed. In this manner *Argyroneta aquatica* is enabled to pursue its prey, to construct its dome-shaped dwelling, and to live habitually in that liquid. There are, however, a few species of small size, *Neriene longipalpis* and *Savignia frontata*, for example, which, though they do not enter water voluntarily, can support life in it for many days, and that without the external supply of air so essential to the existence of *Argyroneta aquatica* under similar circumstances.<sup>3</sup> It is probable that this property may contribute to their preservation through the winter, when their hybernacula are liable to be inundated.

For the purpose of securing their prey, spiders have recourse to divers expedients. Numerous species run rapidly about in quest of those objects which constitute their food; others, approaching their victims with great circumspection, spring upon them from a distance; some lie concealed in flowers, or among leaves, seizing such insects as come within their reach; and many species procure a supply of nutriment by means of complicated snares of their own fabrication. Glossy lines intersecting each other at various angles, and in different planes, disposed, apparently, without any regular plan, compose one kind of snare. Another consists of a thin, horizontal sheet of web, having in connexion with it above, and in some instances also below, a number of slender lines arranged as in the preceding snare. A third kind is

<sup>1</sup> Ibid., vol. xi, pp. 165-167.

<sup>2</sup> 'Researches in Zoology,' p. 356.

<sup>3</sup> 'Report of the Third Meeting of the British Association for the Advancement of Science,' p. 446.



formed of a compact, horizontal sheet of web, with a tube of greater or less dimensions at or near one of its margins, from which several lines frequently extend along its upper surface to the other margins, where they become attached. A fourth presents the appearance of an irregular web of white or bluish silk, the tortuous filaments of which have been curled and inflected by the *calamistra* before described; in this snare one or two funnel-shaped tubes usually occur. The most elegant snares, however, are those constructed with the appearance of geometrical precision in the form of circular nets. They are composed of an elastic spiral line, thickly studded with minute globules of liquid gum, whose circumvolutions, falling within the same plane, are crossed by radii converging towards a common centre, which is immediately surrounded by several circumvolutions of a short, spiral line, devoid of viscid globules, forming a station from which the toils may be superintended by their owner without the inconvenience of being entangled in them. As the radii are unadhesive, and possess only a moderate share of elasticity, they must consist of a different material from that of the viscid, spiral line, which is elastic in an extraordinary degree. Now, the viscosity of this line may be shown to depend entirely upon the globules with which it is studded, for if they be removed by careful applications of the finger, a fine, glossy filament remains, which is highly elastic, but perfectly unadhesive. As the globules, therefore, and the line on which they are disposed, differ so essentially from each other and from the radii, it is reasonable to infer that the physical constitution of these several portions of the net must be dissimilar.

An estimate of the number of viscid globules distributed on the elastic, spiral line in a net of *Epëira apoclista* of a medium size, will convey some idea of the elaborate operations performed by the *Epëiræ* in the construction of their snares. The mean distance between two adjacent radii, in a net of this species, is about seven tenths of an inch; if, therefore, the number seven be multiplied by twenty, the mean number of viscid globules which occur on one tenth of an inch of the elastic spiral line, at the ordinary degree of tension, the product will be 140, the mean number of globules deposited on seven tenths of an inch of the elastic, spiral line; this product multiplied by twenty-four, the mean number of circumvolutions described by the elastic spiral line, gives 3360, the mean number of globules contained between two radii; which, multiplied by twenty-six, the mean number of radii, produces 87,360, the total number of viscid globules in a finished net of average dimensions. A large net, fourteen or sixteen inches in diameter, will be found, by a similar calculation, to contain upwards of 120,000 viscid globules, and yet *Epëira apoclista* will complete its snare in about forty minutes if it meet with no interruption.<sup>1</sup>

In the formation of their snares the *Epëiræ* appear to be regulated solely by the sense of touch, as various species, when confined in spacious glass jars placed in situations absolutely impervious to light, construct nets which do not exhibit the slightest irregularity of plan or defect of structure.

Dr. Lister supposed that spiders are able to retract the lines they spin within the abdomen, and whoever minutely observes the *Epëiræ*, when fabricating their snares, will almost be induced to entertain the same opinion. The viscid line produced by these spiders in their transit from one radius to another, is sometimes drawn out to a much greater extent than is necessary to connect the two, yet on approaching the point at which it is to be attached, it

<sup>1</sup> 'Transactions of the Linnean Society,' vol. xvi, pp. 477-479.

appears to re-enter the spinners, till it is reduced to the exact length required. This optical illusion, for such it is, is occasioned by the extreme elasticity of the line, which may be extended greatly by the application of a slight force, and on its removal will contract proportionally. By this property the viscid, spiral line is accommodated to the frequent and rapid changes in distance which take place among the radii when agitated by winds or other disturbing forces, and by it insects, which fly against the snare, are more completely entangled than they otherwise could be without doing extensive injury to its framework.

Complicated as the processes are by which these symmetrical nets are produced,<sup>1</sup> nevertheless young spiders, acting under the influence of instinctive impulse, display, even in their first attempt to fabricate them, as consummate skill as the most experienced individuals.

By contributing to check the too rapid multiplication of insects, from which they chiefly derive their sustenance, spiders perform an important part in the economy of nature. They devour one another also, the weaker falling victims to the more powerful; and as female spiders, with few exceptions, are larger and more vigorous than males, they frequently prey upon the latter, sometimes, indeed, immediately after they have received their embraces. Their enemies, however, are not limited to those of their own kind; quadrupeds, birds, fishes, reptiles, and even insects, destroy them in large numbers.

Although spiders are not provided with wings, and, consequently, are incapable of flying, in the strict sense of the word, yet, by the aid of their silken filaments, numerous species, belonging to various genera, are enabled to accomplish distant journeys through the atmosphere. These aerial excursions, which appear to result from an instinctive desire to migrate, are undertaken when the weather is bright and serene, particularly in autumn, both by adult and immature individuals, and are effected in the following manner. After climbing to the summits of different objects, they raise themselves still higher by straightening the limbs; then elevating the abdomen, by bringing it from the usual horizontal position into one almost perpendicular, they emit from the spinners a small quantity of viscid fluid, which is drawn out into fine lines by the ascending current occasioned by the rarefaction of the air contiguous to the heated ground. Against these lines the current of rarefied air impinges, till the animals, feeling themselves acted upon with sufficient force, quit their hold of the objects on which they stand and mount aloft.

Spiders do not always ascend into the atmosphere by a vertical movement, but are observed to sail through it in various directions; and the fact admits of an easy explanation when the disturbing causes by which that subtle medium is liable to be affected are taken into consideration. A direction parallel to the horizon will be given by a current of air moving in that plane; a perpendicular one, by the ascent of air highly rarefied; and directions intermediate between these two will, in general, depend upon the composition of forces. When the horizontal and vertical currents are equal in force, the line of direction will describe an angle of  $45^\circ$  nearly with the plane of the horizon; but when their forces are unequal, the angle formed with that plane will be greater or less as one current or the other predominates.

The manner in which the lines are carried out from the spinners by a current of air appears to be this. As a preparatory measure, the spinning mammulæ are brought into close

<sup>1</sup> 'Zoological Journal,' vol. v, pp. 181-188. 'Researches in Zoology,' pp. 253-270.



contact, and viscid matter is emitted from the papillæ; they are then separated by a lateral motion, which extends the viscid matter into fine filaments connecting the papillæ; on these filaments the current impinges, drawing them out to a length which is regulated by the will of the animal, and on the mammulæ being again brought together, the filaments coalesce and form a compound line.

Many intelligent naturalists entertain the opinion that spiders can forcibly propel or dart out lines from the spinners; but when placed on twigs set upright in glass vessels with perpendicular sides, containing a quantity of water sufficient to immerse their bases completely, all the efforts they make to effect an escape uniformly prove unavailing in a still atmosphere. However, should the individuals thus insulated be exposed to a current of air, either naturally or artificially produced, they immediately turn the abdomen in the direction of the breeze, and emit from the spinners a little of their viscid secretion, which being carried out in a line by the current becomes connected with some object in the vicinity, and affords them the means of regaining their liberty. If due precaution be used in conducting this experiment, it plainly demonstrates that spiders are utterly incapable of darting lines from their spinners, as they cannot possibly escape from their confinement on the twigs in situations where the air is undisturbed, but in the agitated atmosphere of an inhabited room they accomplish their object without difficulty. Similar means are frequently employed by spiders in their natural haunts for the purposes of changing their situation and fixing the foundations of their snares.

The webs named gossamer are composed of lines spun by spiders, which, on being brought into contact by the mechanical action of gentle airs, adhere together, till by continual additions they are accumulated into irregular white flakes and masses of considerable magnitude. Occasionally spiders may be found on gossamer webs after an ascending current of rarefied air has separated them from the objects to which they were attached, and has raised them into the atmosphere; but as they never make use of them intentionally in the performance of their æronautic expeditions, it must always be regarded as a fortuitous circumstance.<sup>1</sup>

M. Bon, a Frenchman, and M. Tremeyer, a Spaniard, have succeeded in fabricating stockings, gloves, purses and other articles, of the silk produced by spiders; but the great voracity of these animals, and the difficulty experienced in providing them with food, have hitherto prevented this material from being made available for manufacturing purposes on an extensive scale.

<sup>1</sup> 'Transactions of the Linnean Society,' vol. xv, pp. 449-459. 'Researches in Zoology,' pp. 229-252.

# SPIDERS

OF

## GREAT BRITAIN AND IRELAND.

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CLASS ARACHNIDA. ORDER ARANEIDEA.

*Tribe OCTONOCULINA.*

*Family MYGALIDÆ.*

THE *Mygalidæ*, which abound most in hot climates and comprise the largest spiders known, have the falces articulated horizontally; two branchial and two tracheal opercula, situated near the anterior extremity of the abdomen, on its under side, are conspicuous in most species, but in some the branchial opercula only are apparent; much the greater number are provided with two pairs of spinners, and have the inferior surface of their biungulate tarsi, and of the digital joint of their pediform palpi, in the females, densely clothed with compound, hair-like papillæ, constituting an apparatus which, by the emission of a viscous secretion, enables them to traverse the perpendicular surfaces of dry, highly polished bodies; others have three pairs of spinners, are destitute of hair-like papillæ on the legs and palpi, and have the tarsi terminated by three claws.

The spiders belonging to this extensive family conceal themselves in holes in the earth, in hollow trees, or among the leaves of plants, and prey upon large insects, which they actively pursue or take by surprise; hitherto, only one species has been found in Great Britain.



*Genus* ATYPUS (*Latreille*).

*Eyes* closely grouped on a protuberance at the anterior part of the cephalo-thorax; three on each side describe a triangle whose vertex is directed forwards, and the other two, which are the largest, are placed transversely between the triangles.

*Maxillæ* long, divergent, dilated at the base, where the palpi are inserted, and pointed at the extremity.

*Lip* small and somewhat oval.

*Legs* moderately long; the fourth pair is the longest, a little exceeding the first in longitudinal extent, and the third pair is the shortest.

## ATYPUS SULZERI. Pl. I, fig. 1.

*Atypus Sulzeri*, Latr., Gen. Crust. et Insect., tom. i, p. 85, tab. 5, fig. 2.

— — Hahn, Die Arachn., Band i, p. 117, tab. 31, fig. 88.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 256.

— — Koch, Die Arachn., Band xvi, p. 72, tab. 562, figs. 1547, 1548.

*Oletera atypa*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 243, pl. i, fig. 5.

— *picea*, Koch, Uebersicht des Arachn. Syst. erstes Heft, p. 35.

Length of the female,  $\frac{3}{8}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{5}$ th, breadth,  $\frac{1}{6}$ th; breadth of the abdomen,  $\frac{1}{5}$ th; length of a posterior leg,  $\frac{7}{10}$ ths; length of a leg of the third pair,  $\frac{5}{16}$ ths.

This spider has a large cephalo-thorax, of a remarkable form; it increases gradually in breadth from the posterior to the anterior part, is truncated in front, and somewhat convex in the region of the eyes. The falcæ are powerful, very prominent, greatly curved on the upper part, armed with some strong teeth on the under side, and have three small, obtuse processes near the base of the fang. The lip is situated below a protuberance near the base of the maxillæ, which are fringed with red hairs on the inner surface. The figure of the sternum is semicircular. The legs and palpi are provided with hairs and spines, and the two superior tarsal claws are pectinated. These parts are glossy, and of a reddish-brown colour. The abdomen is oviform, the posterior part being rather the broadest; it is sparingly clothed with hairs, glossy, and of a dark-brown colour, faintly tinged with red; the two superior spinners are long, prominent, and have the spinning-tubes distributed on the inferior surface of the terminal joint.

The male is smaller than the female; it is much darker coloured also, and has on the upper part of the abdomen an oval, glabrous, coriaceous space, which extends about half-way

towards the spinners. The radial joint of the palpi is larger than the cubital, and the digital joint is of an elongated oval form, terminating in a point; this last joint is convex and hairy externally, concave within, comprising the palpal organs, which are globose at the base, with a fine, curved spine at their extremity, and are of a red colour.

Dr. Leach has taken specimens of *Atypus Sulzeri* in the vicinity of London and Exeter. (See the Supplement to the fourth, fifth, and sixth editions of the 'Encyclopædia Britannica,' article "Annulosa.") It excavates, in humid situations, a subterraneous gallery, which is at first horizontal, but inclines downwards towards its termination. In this gallery it spins a tube of white silk, of a compact texture, about half an inch in diameter, and the female deposits between thirty and forty eggs in a cocoon of white silk attached to its extremity. Part of the tube hangs at the outside of the aperture to protect the entrance.

Since the instances of the capture of *Atypus Sulzeri*, recorded by Dr. Leach, several females have been procured by the Rev. Hamlet Clark from the neighbourhood of Carlisle; Mr. R. H. Meade also has received specimens of it from Mr. Newman, which were found in lanes near Hastings in the autumn of 1855; and the Rev. O. P. Cambridge took an adult male early in January, 1857, from a rabbit-earth in Dorsetshire.



*Family* LYCOSIDÆ.

Remarkable differences in size occur among the spiders of this family, which are widely distributed over the earth's surface. They have the falces articulated vertically, and are provided with three pairs of spinners and two branchial opercula, the tracheal opercula, if present, being inconspicuous. The legs taper to the extremity of the tarsi, which are terminated by three claws, and are, for the most part, destitute of hair-like papillæ; a few species have only two claws at the extremity of the tarsi, and a climbing apparatus, in the form of a small scopula, is situated immediately below them.

The *Lycosidæ* pursue or take by surprise the insects that they prey upon among herbage and low bushes, and retire for concealment under stones, fragments of rock, fallen leaves, and into moss and crevices of the earth; they are strongly attached to their offspring, and the females of the species belonging to the genus *Lycosa* connect the cocoon containing their eggs with the spinners by means of short lines of silk; when disengaged from their silken envelope, the young attach themselves to the body of their parent, and so accompany her in all her movements.

Several of the semi-aquatic species belonging to the genera *Lycosa* and *Dolomedes* run fearlessly on the surface of water, and even descend spontaneously beneath it, the time during which they can respire when immersed depending upon the supply of air confined by the circumambient liquid among the hairs with which they are clothed.

*Genus* LYCOSA (*Latreille*).

*Eyes* unequal in size; four, much smaller than the rest, form a transverse row in front of the cephalo-thorax; the other four, situated in front and on the sides of its anterior part, describe a quadrilateral figure, the anterior ones of which are the largest.

*Maxillæ* nearly straight, enlarged, and rounded at their extremity externally.

*Lip* somewhat quadrate, being rather broader at the base than at the extremity.

*Legs* robust; the fourth pair is the longest, then the first, and the third pair is the shortest.

## LYCOSA AGRETYCA. Pl. I, fig. 2.

*Lycosa agretyca*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 308.

— — Blackw., Linn. Trans., vol. xix, p. 118.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, 257.

— *ruricola*, Latr., Gen. Crust. et Insect., tom. i, p. 120.

— — Sund., Vet. Acad. Handl., 1832, p. 192.

*Trochosa trabalis*, Koch, Die Arachn. (Fortsetzung des Hahn'schen Werkes), Band xiv, p. 141, tab. 492, figs. 1371-1374.

Length of the female,  $\frac{7}{16}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{3}$ th, breadth,  $\frac{1}{7}$ th; breadth of the abdomen,  $\frac{1}{6}$ th; length of a posterior leg,  $\frac{9}{16}$ ths; length of a leg of the third pair,  $\frac{7}{10}$ ths.

The cephalo-thorax is compressed before, depressed and rounded on the sides, hairy, with a narrow indentation in the medial line of the posterior region; it is of a dark-brown colour, a broad, red-brown band extending along the middle, the anterior extremity of which is enlarged and comprises two parallel, oblong, dark-brown spots, and above each lateral margin there is a narrow, longitudinal, red-brown band, several obscure lines of the same hue converging from these bands towards the middle. The falces are powerful, conical, and armed with teeth on the inner surface; the maxillæ are strong, and obliquely truncated at the extremity, on the inner side; the lip is nearly quadrate; and the sternum is of a short, oval form. These parts are of a red-brown colour, the falces and lip being the darkest. The lateral eyes of the four constituting the anterior row are somewhat smaller than the intermediate ones. The legs are robust, provided with hairs and black spines, and of a reddish-brown colour, the thighs, which are the palest, being obscurely marked with annuli of a darker hue. Like the other species of the genus, this spider has the superior tarsal claws curved and pectinated, and the inferior one inflected near its base. The palpi have a reddish-brown tint; the digital joint is the darkest, and, in common with the female *Lycosæ*, is terminated by a curved, pectinated claw. The abdomen is oviform, densely covered with hairs, rather broader at the posterior than at the anterior extremity, convex above, projecting over the base of the cephalo-thorax; it is of a yellowish-brown colour, with a large, brownish-black, angular mark on the upper part, at the anterior extremity; to this mark succeeds an oblong, dark, yellowish-brown space, obscurely bordered by a brownish-black line, having an angular projection on each side near its pointed termination, and between it and the spinners there is a series of black, angular lines, which have their vertices directed forwards, and are intersected by transverse, curved lines of a yellowish-brown colour; the lines of both series are enlarged at their extremities, and these enlargements form two rows of black and yellowish-brown spots, disposed alternately, which converge to the spinners; brownish-black spots occur on the sides, and, more sparingly, on the under part; the sexual organs are glossy, of a dark, reddish-



brown hue, with a longitudinal septum in the middle ; and the colour of the branchial opercula is dull yellow. On the anterior part of each side of this species, and of many of its congeners, there is a minute oblong orifice.

The male is smaller and darker coloured than the female, and the tibiæ and metatarsi of its anterior pair of legs are of a very dark-brown colour, but that of the tarsi is red-brown. The cubital and radial joints of the palpi are short, and the digital joint is of an oblong, oval form, being convex and hairy externally, and concave within, at the base ; this concavity comprises the palpal organs, which are neither highly developed nor very complicated in structure, and are of a dark, red-brown colour.

*Lycosa agretyca* occurs in old pastures and on heaths in various parts of the kingdom. It pairs early in spring, and in June the female excavates an elliptical cavity in the earth beneath stones, or selects one suitable for her purpose, into which she retires with her cocoon, which is globular, composed of fine white silk, of a compact texture, and is encircled by a narrow zone of a slighter fabric ; it measures one fourth of an inch in diameter, and contains about 110 spherical eggs, of a pale-yellow colour, not agglutinated together. Influenced by those instinctive impulses which regulate the economy of the *Lycosæ*, the female attaches the cocoon to her spinners by short lines of silk, and the young, when they quit it, mount upon her body, and so accompany her in all her movements. This species frequently passes the winter in a torpid or semi-torpid state, in cavities in the earth, under stones.

An adult female *Lycosa agretyca*, taken in the spring of 1849, was destitute of the posterior eye on the right side.

The genus *Trochosa*, which M. Koch has proposed to found upon this and some other species of *Lycosæ*, is based on specific characters solely.

*Lycosa agretyca* has been captured in Scotland by Mr. James Hardy, and in Ireland by Mr. Robert Templeton.

#### LYCOSA CAMPESTRIS. Pl. I, fig. 3.

*Lycosa campestris*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 309.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 257.

— *ruricola*, Hahn, Die Arachn., Band i, p. 103, tab. 26, fig. 77 (misnumbered 76 in the text).

— — Koch, Uebersicht des Arachn. Syst. erstes Heft, p. 21.

*Trochosa* — Koch, Die Arachn., Band xiv, p. 138, tab. 491, figs. 1369, 1370.

*Titulus*, 26, Lister, Hist. Animal. Angl. De Aran., p. 78, tab. 1, fig. 26.

Length of the female,  $\frac{9}{20}$ ths of an inch ; length of the cephalo-thorax,  $\frac{1}{5}$ th, breadth,  $\frac{3}{20}$ ths ; breadth of the abdomen,  $\frac{1}{4}$ th ; length of a posterior leg,  $\frac{7}{12}$ ths ; length of a leg of the third pair,  $\frac{5}{16}$ ths.

This species is quite distinct from *Lycosa agretyca*, with which it is frequently confounded. The form of its cephalo-thorax is that common to the *Lycosæ* generally, with slight modifications; it is compressed before, depressed and rounded on the sides, hairy, and has a narrow indentation in the medial line of the posterior region; its colour is greenish-brown, a broad yellowish-brown band extending along the middle, the anterior extremity of which is enlarged and comprises two parallel, oblong, greenish-brown spots, and above each lateral margin there is a narrow, longitudinal, yellowish-brown band, several obscure lines of the same hue converging from these bands towards the middle. The falces are powerful, conical, and armed with a few teeth on the inner surface; their colour is dark-brown, tinged with red. The maxillæ are strong, somewhat curved towards the lip, and of a brown colour, the extremities, which are obliquely truncated on the inner side, being much the palest. The lip is nearly quadrate and of a dark-brown hue; and the colour of the short oval sternum is yellowish-brown. The intermediate eyes of the anterior row are larger than the lateral ones. The legs are robust, provided with hairs and black spines, and of a yellowish-brown colour, slightly tinged with green, except the tarsi, which have a pale-brown hue; faint traces of annuli may sometimes be observed on the thighs. The palpi are of a yellowish-brown hue, with the exception of the digital joint, which has a reddish-brown tint. The abdomen is oviform, densely covered with hairs, rather broader at the posterior than at the anterior extremity, convex above, projecting over the base of the cephalo-thorax; the upper part is of a greenish-brown colour, with a few minute dark spots distributed over its surface; a yellowish-brown band extends along the middle, nearly half way towards the spinners, where it terminates in a point, and on each side of the posterior extremity of this band there commences a series of obscure, yellowish-brown, and dark spots, disposed alternately; both series converge towards the spinners, where they meet; the under part is of a yellow colour, that of the branchial opercula being rather paler; the sexual organs, which are of a dark, reddish-brown hue, have a longitudinal septum in the middle.

The male, though smaller than the female, resembles her in the general distribution of its colours, except that the tibiæ, metatarsi, and tarsi of the anterior pair of legs, and the digital joint of the palpi, are of a dark-brown hue. The fang with which each falx is provided has a small prominence near its base, on the outer side, but that of the female is plain. The cubital and radial joints of the palpi are short, the latter being the larger; the digital joint is of an oblong oval form, and has a plain, curved claw at its extremity; it is convex and hairy externally, and concave within, at the base; this concavity comprises the palpal organs, which are neither highly developed nor very complicated in structure, and are of a dark, red-brown colour.

Meadows and pastures are the favorite haunts of this species, which pairs in May. In June the female fabricates a globular cocoon of compact white silk, measuring  $\frac{1}{5}$ th of an inch in diameter; it is encompassed by a narrow zone of a slighter texture, and usually comprises about 115 spherical eggs, of a pale-yellow colour, which, like those of the other species of this genus, are not agglutinated together. The cocoon has the appearance of being embossed, in consequence of its close application to the eggs. Both sexes sometimes excavate elliptical cavities in the ground, generally under stones, and remain concealed in them during the winter months.

In the summer of 1836 an adult female was captured, which had a short but perfectly

formed supernumerary tarsus connected with the base of the tarsal joint of the right posterior leg, on its outer side ; and in the spring of 1851 another adult female was obtained which had only six eyes ; not the slightest rudiment of the lateral eyes of the anterior row was perceptible, even with the aid of a powerful magnifier.

Mr. R. Templeton has taken this species in Ireland.

LYCOSA ANDRENIVORA. Pl. I, fig. 4.

*Lycosa andrenivora*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 315.

— — Blackw., Linn. Trans., vol. xix, p. 118.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 258.

Length of the female,  $\frac{1}{2}$  an inch ; length of the cephalo-thorax,  $\frac{1}{5}$ th, breadth,  $\frac{1}{5}$ th ; breadth of the abdomen,  $\frac{3}{8}$ ths ; length of a posterior leg,  $\frac{3}{8}$ ths ; length of a leg of the third pair,  $\frac{11}{24}$ ths.

Considerable variety may be observed among individuals of this species, some being much lighter coloured than others. The intermediate eyes of the anterior row are rather larger than the lateral ones. The cephalo-thorax is hairy, marked with furrows on the sides, which converge towards the middle, and has a narrow indentation in the posterior region ; its colour is dark-brown, with yellowish-brown margins, and a band of the latter hue extending along the middle, which is broadest at the anterior extremity. The falces are powerful, and are armed with teeth on the inner surface ; the lip is rather longer than broad ; and the sternum is heart-shaped. These parts are of a dark-brown colour, with the exception of the extremity of the lip, which has a red-brown hue. The maxillæ are obliquely truncated at the extremity, on the inner side, and are of a reddish-brown colour. The legs and palpi have a reddish-brown tint, and are marked with brownish-black annuli. The abdomen is oviform, hairy, convex above, projecting over the base of the cephalo-thorax ; it is of a dark-brown colour on the upper part, with three small tufts of yellowish-brown hairs at its anterior extremity ; a broad band of a pale, yellowish-brown colour, extends along the middle and tapers to the spinners ; the anterior part of the band comprises an oblong, brownish-black mark, having an angular projection on each side, and its posterior extremity bifid ; between this mark and the spinners there is a series of black lines, forming very obtuse angles, whose vertices and extremities are the most distinct ; the sides are mottled with yellowish-brown, and the under part is of a pale, yellowish-brown hue.

The male is smaller and slenderer than the female, and the colour of the margins of the cephalo-thorax and of the broad band extending along its middle is gray. The legs have a yellowish-gray hue, and are without annuli ; but the under part of the femora, the tibiæ, and the base of the metatarsi of the anterior pair, are black, tinged with brown, the tibiæ being densely covered with long black hairs on the under side. The palpi are of a brownish-black hue, with a tinge of red ; the cubital and radial joints are short, the latter being rather the



larger, and the digital joint is of an oblong oval form, convex and hairy externally, and concave within, at the base; this concavity comprises the palpal organs, which are moderately developed, rather complicated in structure, with a minute, curved, prominent process on the outer side, having immediately before it a small, semi-transparent membrane, and are of a brownish-black hue, with parts of a pale, yellowish-brown colour intermixed. The band extending along the middle of the abdomen, the oblong mark comprised in its anterior part, and the series of obtusely angular lines occupying the space between that mark and the spinners, are much paler than in the female; and the under part of the abdomen is of a yellowish-gray colour.

This spider frequents commons and old pastures. The palpal organs of the male are fully developed in autumn.

LYCOSA RAPAX. Pl. I, fig. 5.

*Lycosa rapax*, Blackw., Linn. Trans., vol. xviii, p. 609.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 258.

Length of the female,  $\frac{3}{8}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{8}$ th; breadth of the abdomen,  $\frac{1}{7}$ th; length of a posterior leg,  $\frac{1}{2}$ ; length of a leg of the third pair,  $\frac{3}{8}$ ths.

The cephalo-thorax is large, hairy, and marked with slight furrows on the sides, which converge towards a narrow indentation in the medial line; it is of a dark-brown colour, with a broad, yellowish-brown band extending along the middle, and an obscure one of the same hue above each lateral margin. The falces are powerful, conical, and armed with a few teeth on the inner surface; their colour is dark-brown, faintly tinged with red near the base, in front. The maxillæ have a reddish-brown hue. The colour of the lip is dark-brown, with the exception of the extremity, which has a reddish-brown tint. The sternum is heart-shaped, glossy, and has a brownish-black hue. The legs are robust, and of a reddish-brown hue, with brownish-black spots and streaks on the thighs; and the colour of the palpi resembles that of the legs. The abdomen is oviform, hairy, convex above, projecting over the base of the cephalo-thorax; a broad, yellowish-brown band, which tapers to the spinners, occupies the middle of the upper part; anteriorly it comprises an oblong oval mark of a deeper shade, whose margins are blackish; this mark extends nearly half the length of the abdomen, and terminates in a point; the yellowish-brown band has a black border, broken into spots posteriorly, which spots form, with smaller confluent ones of the same hue, oblique lines extending down the sides, the ground-colour of which is yellowish-brown; the under part also has a yellowish-brown hue, and is marked with three obscure, longitudinal, dark-brown bands; the colour of the branchial opercula is brown, the inner margin having a tinge of red; and the sexual organs, which have a dark, reddish-brown hue, are bisected longitudinally by a septum. Some individuals have the posterior half of the yellowish-brown abdominal band

intersected by obscure, curved, whitish lines, whose extremities alternate with the black spots with which it is bordered.

The male is smaller, darker coloured, and more distinctly marked than the female. Its cephalo-thorax has a brownish-black colour, and the broad band in the medial line is whitish. The thighs and tibiæ of the first pair of legs, and the thighs of the second pair have a very dark-brown hue, approaching to black. The colour of the palpi is brownish-black, and the humeral joint is abundantly supplied with black hairs on the under side; the cubital and radial joints are short, the latter being rather the stronger; the digital joint is oval, convex and hairy externally, and concave within, except at the extremity, which is compact and pointed; the concavity comprises the palpal organs, which are highly developed, complicated in structure, with a strong, prominent, corneous process on the outer side, and are of a dark, reddish-brown colour. The black border to the broad yellowish-brown band extending along the middle of the upper part of the abdomen usually preserves its continuity, but in some instances its posterior half is broken into large spots.

The customary haunts of this species are woods, pastures, and commons; but it may be seen occasionally on the summits of the highest mountains in England and Wales. It pairs in May, and in June the female deposits sixty or seventy spherical eggs, of a pale-yellow colour, in a globular cocoon of light, yellowish-brown silk, of a compact texture, measuring  $\frac{5}{32}$ ths of an inch in diameter.

M. Walckenaer considers *Lycosa rapax* to be merely a variety of *Lycosa vorax* ('Hist. Nat. des Insect. Apt.,' t. iv, p. 392); but, though nearly allied to that species, it differs from it in size, structure and colour, and more closely resembles the *Lycosa (Tarantula) gasteinenis* of M. Koch ('Die Arachn.,' B. xiv, p. 187, tab. 501, figs. 1401, 1402.

#### LYCOSA HERBIGRADA. Pl. I, fig. 6.

*Lycosa herbigrada*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. xx, p. 285.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xx, p. 497.

Length of the female,  $\frac{3}{10}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{12}$ th; breadth of the abdomen,  $\frac{1}{10}$ th; length of a posterior leg,  $\frac{1}{2}$ ; length of a leg of the third pair,  $\frac{1}{3}$ d.

The two intermediate eyes of the anterior row are rather the smallest. The cephalo-thorax is compressed before, depressed and rounded on the sides, and has a slight longitudinal indentation in the medial line; it is of a red-brown colour, the space comprising the eyes, a broad, irregular band extending along each side, and a narrow line on each lateral margin, having a brown-black hue; the red-brown spaces are covered with grayish hairs, and the medial one is abruptly contracted near its anterior extremity. The falces are powerful,

conical, and armed with a few teeth on the inner surface; the maxillæ are short, straight, and enlarged and rounded at the extremity; the palpi are moderately long, and are terminated by a curved, pectinated claw. These parts have a red-brown hue, the maxillæ being the palest, and the palpi the darkest at their articulations. The lip is nearly quadrate, being rather broader at the base than at the apex, and is of a dark-brown colour. The sternum is heart-shaped, clothed with grayish hairs, and is of a red-brown hue, with an oval space in the middle bounded by a fine, dentated, brown-black line, and has spots of the same hue on the lateral margins. The legs are long, moderately robust, provided with hairs and sessile spines, and are of a red-brown hue, with dark-brown streaks, spots, and annuli. The abdomen is oviform, hairy, convex above, and projects over the base of the cephalo-thorax; it is of a reddish-brown colour, the under part being the palest, and has on each side of the upper part a strongly dentated, brownish-black band; these bands taper to the spinners, where they unite, and from some of their larger exterior angles rows of brownish-black spots pass obliquely to the sides, which are marked with other spots of the same hue; in the anterior part of the space comprised between the dentated, brownish-black bands there is an oblong-oval, reddish-brown mark, bounded by a fine black line, having an acute angular point on each side, and its posterior extremity bifid; the sexual organs, which are highly developed and prominent, have a dark, reddish-brown colour, and that of the branchial opercula is brown.

The male is smaller than the female, and the design formed by the distribution of its colours is less distinctly marked. The palpi are of a red-brown colour, the digital joint and the outer side of the humeral joint being much the darkest; the digital joint is oval, convex, and hairy externally, concave within, comprising the palpal organs, which are moderately developed, not very complex in structure, and of a reddish-brown colour.

Two adult and two immature females of this *Lycosa* were received from Mr. R. H. Meade, in December, 1856. The two former were discovered by the Rev. O. P. Cambridge under a stone, near Pennsylvania Castle, in the Isle of Portland, on the 29th of September, 1854; and the two latter were captured in July, 1854, in Morden Park, near Bloxworth House, Dorsetshire, by the same gentleman, who also took an adult male in the summer of 1858.

LYCOSA ALLODROMA. Pl. 1, fig. 7.

*Lycosa allodroma*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 330.

— — Koch, Die Arachn., Band v, p. 106, tab. 172, figs. 410, 411.

— — Koch, Uebersicht des Arachn. Syst. erstes Heft, p. 22.

— — Blackw., Linn. Trans., vol. xix, p. 118.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 258.

— *cinerea*, Sand., Vet. Acad. Handl., 1832, p. 190.



*Lycosa lynx*, Hahn, Die Arachn., Band ii, p. 13, tab. 42, fig. 104.

— *leucophæa*, Blackw., Lond. and Edinb. Phil. Mag., third series, vol. x, p. 104.

*Arctosa cinerea*, Koch, Die Arachn., Band xiv, p. 123, tab. 488, fig. 1358.

Length of the female,  $\frac{3}{8}$ ths of an inch; length of the cephalo-thorax,  $\frac{3}{10}$ ths, breadth,  $\frac{11}{16}$ ths; breadth of the abdomen,  $\frac{11}{16}$ ths; length of a posterior leg, 1 inch; length of a leg of the third pair,  $\frac{1}{3}$ ths.

This fine species has the lateral eyes of the four constituting the anterior row smaller than the intermediate ones. Its cephalo-thorax is large, thickly covered with hairs, and of a greenish-brown colour; the carina or most elevated part in the medial line is the darkest, and on each side of the eyes describing the quadrilateral figure there are two imperfectly defined, yellowish-white spots. The falces are powerful, conical, armed with teeth on the inner surface, supplied with grayish hairs in front, and densely fringed with pale-red ones near the extremity, on the inner side; these organs, with the maxillæ and lip, are of a very dark-brown colour, the maxillæ being paler at the extremity, which is fringed with light-red hairs on the inner side. The sternum is heart-shaped, of a dark-brown hue, and covered with hoary hairs. The legs are robust, abundantly provided with hairs and spines, and are of a yellowish-brown colour, with spots and annuli of a dark-brown hue. The palpi resemble the legs in colour. The abdomen is oviform, hairy, rather broader at the posterior than at the anterior extremity, convex above, projecting over the base of the cephalo-thorax; its colour is grayish-brown, faintly tinged with olive; a broad, obscure, dentated band, of a lighter hue, which terminates in three points, extends from the anterior part along the middle, nearly half of its length, and a series of pale, transverse, curved lines, somewhat enlarged at their extremities, and diminishing in length as they approach the spinners, occupies the space between the termination of the band and the extremity of the abdomen; the under part is of a yellow-brown colour.

The male is smaller, lighter coloured, and more distinctly marked than the female. The radial joint of the palpi is rather longer than the cubital, and the digital joint is of an oblong oval form, convex above, hairy, and of a dull-brown hue; underneath, near its base, there is a small concavity comprising the palpal organs, which are neither highly developed nor complicated in structure, and are of a dark, red-brown colour.

In the spring of 1836 this light-coloured variety of *Lycosa allodroma* was discovered among water-worn stones and fragments of rock on the banks of the river Llugwy, near Capel Curig, Caernarvonshire, and was described in the 'London and Edinburgh Philosophical Magazine,' under the appellation of *Lycosa leucophæa*.

The genus *Arctosa*, proposed by M. Koch for the reception of this and several other species of *Lycosæ*, like his genus *Trochosa*, is founded solely on specific characters.

## LYCOSA PICTA. Pl. I, fig. 8.

*Lycosa picta*, Hahn, Die Arachn., Band i, p. 106, tab. 27, fig. 79.

— — Blackw., Linn. Trans., vol. xix, p. 119.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 259.

*Arctosa* — Koch, Die Arachn., Band xiv, p. 130, tab. 489, figs. 1362, 1363.

Length of the female,  $\frac{3}{8}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{6}$ th; breadth,  $\frac{1}{8}$ th; breadth of the abdomen,  $\frac{3}{16}$ ths; length of a posterior leg,  $\frac{1}{4}$ ; length of a leg of the third pair,  $\frac{7}{16}$ ths.

The intermediate eyes of the anterior row are rather larger than the lateral ones. The cephalo-thorax is of a red-brown colour, with a broad, irregular, brownish-black band on each side, narrow lateral margins of the same hue, and is clothed with yellowish-white hairs. The falces are powerful, conical, armed with teeth on the inner surface, and of a dark, reddish-brown colour, being palest in front. The maxillæ are slightly curved towards the lip, and, with the latter, are of a dark-brown colour, tinged with red at the extremity. The sternum is heart-shaped, and has a brownish-black hue. The legs and palpi are robust, provided with hairs and spines, and are of a pale, reddish-brown colour with brownish-black annuli. The abdomen is oviform, hairy, rather broader at the posterior than at the anterior extremity, convex above, projecting over the base of the cephalo-thorax; its prevailing colour is dull or brownish-yellow, the under part being yellowish-white; in front of the upper part, contiguous to the cephalo-thorax, there is a large, tripartite, brownish-black mark, the intermediate division, which is the smallest, being bifid; to this succeeds a yellowish-white mark of a similar form, except that the intermediate division is the longest, and terminates in a point; on each side of this point two parallel, yellowish-white spots occur, the four forming a transverse row; a series of black and yellowish-white spots, disposed alternately, extends on each side of the medial line of the posterior half of the abdomen; the first black spot of each series and the first yellowish-white one, which is much the longest, are the most conspicuous; sometimes the space between these series is obscurely marked with black and yellowish-white, curved, transverse lines; the sexual organs are of a reddish-brown colour, and have a longitudinal septum in the middle.

The male is smaller and darker coloured than the female. The cubital and radial joints of its palpi are short; the digital joint, which has a tinge of brown, is of an oblong-oval form; it is convex and hairy externally, and concave within, at the base; this concavity comprises the palpal organs, which are neither highly developed nor very complicated in structure, and are of a dark, reddish-brown colour.

M. Walckenaer, regarding this handsome spider as identical with *Lycosa allodroma*, has placed the name given to it by M. Hahn among the synonyma of that species ('Hist. Nat. des Insect. Apt.,' tom. i, p. 330). Of the specific distinctness of *Lycosa picta*, however, no doubt can be entertained by those observers who have had an opportunity of inspecting adult

individuals. It is found in Cheshire, Lancashire, and Denbighshire, frequenting sandy districts on the sea-coast.

*Lycosa picta* has been taken in Scotland by Mr. J. Hardy, and in Ireland by Mr. R. Templeton.

**LYCOSA SACCATA.** Pl. II, fig. 9.

*Lycosa saccata*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 326.

— — Hahn, Die Arachn., Band i, p. 108, tab. 27, fig. 81.

— — Latr., Gen. Crust. et Insect., tom. i, p. 120.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 259.

— (*Pardosa*) *saccata*, Koch, Die Arachn., Band xv, p. 51, tab. 517, figs. 1451, 1452.

— *amentata*, Sund., Vet. Acad. Handl., 1832, p. 177.

*Titulus* 25, Lister, Hist. Animal. Angl., De Aran., p. 77, tab. 1, fig. 25.

Length of the female,  $\frac{1}{3}$ d of an inch; length of the cephalo-thorax,  $\frac{3}{20}$ ths; breadth,  $\frac{1}{5}$ th; breadth of the abdomen,  $\frac{1}{8}$ th; length of a posterior leg,  $\frac{11}{20}$ ths; length of a leg of the third pair,  $\frac{2}{3}$ ths.

The cephalo-thorax is of a dark-brown colour, with yellowish-brown margins, and a band of the same hue extending along the middle; the anterior part of this band is abruptly enlarged, and the posterior part terminates in a point. The falces are powerful, conical, armed with a few teeth on the inner surface, and of a reddish-brown colour, being darkest at the extremity. The sternum is heart-shaped, of a very dark-brown hue, and is thinly covered with whitish hairs. The maxillæ are of a pale, reddish-brown colour, and the lip has a dark-brown hue, tinged with red. The legs and palpi are of a reddish-brown colour, with dark-brown annuli, and are furnished with hairs and long spines. The abdomen is oviform, hairy, rather broader at the posterior than at the anterior extremity, convex above, projecting over the base of the cephalo-thorax; its colour is yellowish-brown, the under part being the palest; in front of the upper part, contiguous to the cephalo-thorax, there is a large black mark, of an angular form, within the vertex of which there is a tuft of yellowish-white hairs, a smaller tuft occupying a place on each side of it; a short, longitudinal, yellowish-brown band, obscurely defined by a black border, succeeds to this mark, and a series of irregular black and pale, yellowish-brown spots, disposed alternately, occurs on each side of the medial line, both of which converge to the spinners; in the interval between these series there are a few minute black spots, and the sides are mottled with black; the branchial opercula are of a dark-brown colour.

The male is smaller and darker coloured than the female, but the annuli on the legs are less distinct. The palpi are black; the cubital and radial joints are short, the latter, which is the larger, being amply provided with black hairs; the digital joint is oval, convex, and hairy externally, and concave within, at the base; this concavity comprises the palpal organs,



which are moderately developed, with a prominent, slightly curved, pointed spine directed forwards, and are of a very dark-brown colour, tinged with red.

In most parts of Great Britain this is a common species. It pairs early in spring, and the female deposits about fifty spherical eggs, of a pale-yellow colour, not agglutinated together, in a lenticular cocoon of compact silk, of a yellowish-brown hue, which measures one fifth of an inch in diameter, and is encircled by a light-coloured zone of a slight texture.

Specimens of this spider have been captured by Mr. J. Hardy in Scotland, and by Mr. R. Templeton in Ireland.

LYCOSA LUGUBRIS. Pl. II, fig. 10.

*Lycosa lugubris*, Walek., Hist. Nat. des Insect. Apt., tom. i, p. 329.

— — Blackw., Linn. Trans., vol. xix, p. 119.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 260.

— *sylvicola*, Sund., Vet. Acad. Handl., 1832, p. 176.

— *sylvicultrix*, Koch, Die Arachn., Band iii, p. 25, tab. 82, figs. 182, 183.

— (*Pardosa*) *alacris*, Koch, Die Arachn., Band xv, p. 39, tab. 514, figs. 1443, 1444.

Length of the female,  $\frac{3}{10}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th; breadth,  $\frac{1}{11}$ th; breadth of the abdomen,  $\frac{1}{9}$ th; length of a posterior leg,  $\frac{1}{4}$ ; length of a leg of the third pair,  $\frac{7}{10}$ ths.

The female of this species is frequently mistaken for the female of *Lycosa saccata*; but they differ in various particulars, as may be seen by comparing the descriptions. The cephalo-thorax of *Lycosa lugubris* is of a dark-brown colour, approaching to black, with a yellowish-brown band extending along the middle, which gradually increases in breadth from its posterior to its anterior extremity, and two obscure, parallel lines of the same hue above the lateral margins. The falces are powerful, conical, armed with a few teeth on the inner surface, and of a red-brown colour. The sternum is heart-shaped, of a brownish-black hue, and is sparingly covered with whitish hairs. The maxillæ are of a pale, red-brown colour; and that of the lip is dark-brown, tinged with red. The legs and palpi have a reddish-brown hue, with dark-brown annuli, and are provided with hairs and long spines. The abdomen is oviform, hairy, rather broader at the posterior than at the anterior extremity, projecting over the base of the cephalo-thorax; its colour is yellowish-brown, the under part being the palest; in front of the upper part, contiguous to the cephalo-thorax, there is a large black mark, of an angular form, within the vertex of which there is a tuft of whitish hairs, a smaller one occurring on each side of it; in the medial line of the anterior part there is a short, yellowish-brown band, obscurely defined by a black border; it is succeeded by several indistinct, triangular, black spots, and on each side of them there is a series of black and pale, yellowish-

brown spots, disposed alternately, both of which converge to the spinners; the sides are mottled with black; and the branchial opercula are of a dark-brown colour.

The male is much smaller and darker coloured than the female. Its cephalo-thorax is black, with a white band extending along the middle, the pale lines near the margins being almost obliterated. The falces are of a very dark, reddish-brown colour; the maxillæ have a red-brown hue; and the sternum is black. The abdomen is black, with a tinge of brown on the under part, and a profusion of white hairs on the upper part. The legs are long and slender, and the thighs have a brown-black hue, except at the extremities, which, with the tibiæ, metatarsi and tarsi, are of a pale-brown colour. The palpi are black; the cubital and radial joints are short, and the latter, which is the larger, is abundantly supplied with black hairs; the digital joint is of an oblong-oval form, convex and hairy externally, and concave within, at the base; this concavity comprises the palpal organs, which are moderately developed, with a prominent, slightly curved, pointed spine, directed forwards, and are of a dark-brown colour, approaching to black.

The description of *Lycosa lugubris*, given by M. Walckenaer, is applicable to the male only. Among the synonyma of this species he has included the *Lycosa meridiana* of M. Hahn ('Die Arachn.,' Band i, p. 20, tab. 5, fig. 16), a spider decidedly superior in size and unlike it in colour, and has placed the *Lycosa sylvicultrix* of M. Koch, which is identical with *Lycosa lugubris*, among the synonyma of *Lycosa vorax* ('Hist. Nat. des Insect. Apt.,' tom. 1, p. 313).

M. Koch states that the male of *Lycosa alacris* (*Lycosa lugubris*) has a fine, red spot on the back of the digital joint (des Endgliedes) of the palpi ('Die Arachn.,' Band xv, p. 41); but this must be a very unusual circumstance, as among several thousand males not one may be observed to possess this character.

*Lycosa lugubris* abounds in the woods of Denbighshire and Caernarvonshire. The sexes pair in April and May, and in the latter month the female deposits about fifty spherical eggs, of a pale-yellow colour, not agglutinated together, in a cocoon of a lenticular form and compact texture, composed of silk of a dull-greenish or yellowish-brown hue, and encircled by a whitish zone of a slight fabric; it measures one fifth of an inch in diameter.

#### LYCOSA OBSCURA. Pl. II, fig. 11.

*Lycosa obscura*, Blackw., Linn. Trans., vol. xviii, p. 611.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 260.

Length of the female,  $\frac{1}{5}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th; breadth,  $\frac{1}{14}$ th; breadth of the abdomen,  $\frac{1}{12}$ th; length of a posterior leg,  $\frac{9}{34}$ ths; length of a leg of the third pair,  $\frac{1}{4}$ th.

The cephalo-thorax is of a dark-brown colour; an obscure, reddish-brown band extends

along the middle, and a narrow one of the same hue above each lateral margin. The falces are conical, and are armed with a few teeth on the inner surface; and the sternum is heart-shaped. These parts, with the maxillæ and lip, are of a dark-brown hue, the sternum being sparingly covered with whitish hairs, and the lip and maxillæ having a tinge of red. The legs have a reddish-brown hue, with dark-brown annuli; the posterior pair is the longest, and the other three pairs are nearly of equal length. The colour of the palpi is dark, reddish-brown. The abdomen is oviform, hairy, rather broader at the posterior than at the anterior extremity, convex above, projecting over the base of the cephalo-thorax, and has three minute tufts of yellowish hairs in front; the upper part is of a dark-brown colour, tinged with red, and in the medial line of the anterior region there is an oblong-oval band of a lighter hue, which extends rather more than a third of its length; this band is bordered by a black line, having an angular point on each side, near its termination, and between it and the spinners there is a row of obscure, blackish spots; on each side of the posterior half of the medial line there is an indistinct series of blackish and whitish spots, disposed alternately, the latter being the more minute, and these series converge to the spinners; the under part is hoary, or of a pale, yellowish-brown hue; and the sexual organs, which are of a very dark-brown colour, tinged with red, have a longitudinal septum in the middle. After the female has exercised her parental functions the prevailing hue of the upper parts becomes dark-brown, almost every trace of design being effaced.

The male is rather smaller than the female, but it resembles her in colour. The eubital and radial joints of the palpi are short, the latter being the larger; the digital joint is oval, convex, and hairy externally, and concave within, except at the extremity, which is compact and armed with a small, curved claw; the concavity comprises the well-developed palpal organs, which have a strong, pointed spine near their centre, directed downwards and outwards, and a finer one passing from the inner side obliquely under it; their colour is reddish-brown.

In autumn, females of this species may be seen among short grass and heath, in pastures, and on commons in various parts of Great Britain and Ireland, with their cocoons attached to their spinners. The cocoon is lenticular, and measures one seventh of an inch in diameter; it is constructed of compact, pale-brown, or dull, greenish-brown silk, is encircled by a narrow, whitish zone of a slight texture, and contains about twenty-five spherical eggs of a yellow colour.

On the 12th of September, 1838, a minute black insect of the family *Ichneumonidæ* came out of a cocoon belonging to a spider of this species, which had been placed in a phial.

Differences in size, colour, habits, and haunts, serve to distinguish *Lycosa obscura* from *Lycosa paludicola*, though their specific identity is assumed by M. Walckenaer ('Hist. Nat. des Insect. Apt.,' t. iv, p. 396).

#### LYCOSA EXIGUA. Pl. II, fig. 12.

*Lycosa exigua*, Blackw., Lond. and Edinb. Phil. Mag., third series, vol. viii, p. 490.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 261.



Length of the female,  $\frac{1}{4}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th; breadth,  $\frac{1}{11}$ th; breadth of the abdomen,  $\frac{1}{10}$ th; length of a posterior leg,  $\frac{11}{32}$ ths; length of a leg of the third pair,  $\frac{3}{10}$ ths.

The lateral eyes of the four forming the anterior row are smaller than the intermediate ones. The cephalo-thorax is large, hairy, and of a dark-brown colour; a narrow, pale, yellowish-brown band extends along its middle, and two parallel lines of the same hue occur above each lateral margin. The falcæ are conical, armed with a few teeth on the inner surface, and have a reddish-brown hue. The sternum is heart-shaped, of a very dark-brown colour, approaching to black, and is sparingly covered with whitish hairs. The maxillæ have a pale, reddish-brown hue; and that of the lip is dark-brown, being palest at the extremity. The legs and palpi are long, and are provided with hairs and strong spines; their colour is pale-reddish or yellowish-brown, with spots and longitudinal streaks of a brownish-black hue on the upper part and sides, which are most conspicuous on the thighs and on the humeral joint of the palpi. The abdomen is oviform, hairy, convex above, projecting over the base of the cephalo-thorax; the colour of the upper part is dark-brown; a large, black, angular mark occurs at its anterior extremity, and within the vertex of the angle and on each side of it there is a small tuft of yellowish-white hairs; to this mark succeeds an oblong-oval band, of a pale, yellowish-brown colour, faintly bordered with black, which extends rather more than a third of its length, and on each side of the posterior half of the medial line there is a series of black and white spots disposed alternately, the latter being much the smaller; the two series, which in some individuals are rather obscure, converge to the spinners, where they meet; the colour of the sides is yellowish-brown, spotted with dark-brown, and the under part has a pale-reddish, or yellowish-brown tint; the sexual organs, which have a longitudinal septum in the middle, are of a red-brown colour; and that of the branchial opercula is very dark-brown.

The male is rather smaller and darker coloured than the female. The base of the humeral joint and the entire digital joint of the palpi are of a brownish-black hue; the cubital and radial joints are short, the latter being the larger, and the digital joint, which is oval, is terminated by a small, curved claw; it is convex and hairy externally, concave within, except at the extremity, which is compact, and comprises the palpal organs; they are highly developed, complex, with corneous processes, and are of a very dark, reddish-brown colour.

Heaths and pastures are the localities most frequented by this species, which is often plentiful in such situations. In June the female constructs a lenticular cocoon, of compact, yellowish, or greenish-brown silk, encircled by a whitish zone of a slighter texture; it measures one sixth of an inch in diameter, and contains between fifty and sixty yellowish-white eggs, of a spherical figure.

Both immature and adult individuals of this spider, which is nearly allied to the *Lycosa* (*Pardosa*) *monticola* of M. Koch ('Die Arachn.,' Band xv, p. 42, tab. 515, figs. 1445-1447, and tab. 516, figs. 1448, 1449), employ their silken lines to effect aërial excursions, ascending currents of rarefied air, frequently acting on the lines with sufficient force to raise the adventurous aëronauts into the atmosphere.

Inhabits Scotland.

## LYCOSA FLUVIATILIS. Pl. II, fig. 13.

*Lycosa arenaria*, Koch, Die Arachn., Band xv, p. 36, tab. 514, figs. 1441, 1442.

— *pallida*, Blackw., Linn. Trans., vol. xix, p. 119.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 261.

Length of the female,  $\frac{7}{8}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th; breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{1}{5}$ th; length of a posterior leg,  $\frac{9}{20}$ ths; length of a leg of the third pair,  $\frac{5}{16}$ ths.

The colour of the cephalo-thorax is dark-gray, tinged with yellow, the medial line and margins being the palest. The falcies are conical, armed with a few teeth on the inner surface, and of a reddish-brown colour. The sternum is heart-shaped, of a very dark-brown hue, and is sparingly covered with whitish hairs. The maxillæ have a pale, reddish-brown tint; and the lip has a dark-brown hue. The legs and palpi are of a yellowish-brown colour, with obscure annuli and spots of a dark-brown hue, and are provided with hairs and long spines. The abdomen is hairy, rather broader at the posterior than at the anterior extremity, convex above, projecting over the base of the cephalo-thorax, and is of a yellowish-gray colour, the under part being the palest; in front of the upper part there is a large black spot, immediately above and on each side of which there is a small tuft of whitish hairs; behind the central tuft there is a short, pale, yellowish-gray band, and a series of irregular black spots occurs on each side of the medial line, alternating with which are minute whitish spots formed by the extremities of obscure, curved lines, occupying the space comprised between these series; the branchial opereula have a dark-brown hue.

The male is considerably smaller and darker coloured than the female; its legs are less distinctly marked with annuli, and the tarsi of the anterior pair have a brownish-black hue. The colour of the cephalo-thorax is brownish-black, with a narrow band of whitish hairs extending along the middle, and an obscure one of the same hue on each lateral margin. The falcies are of a dark, reddish-brown colour, and the maxillæ and lip are almost black. The palpi are black; the cubital and radial joints are short, the latter, which is the stronger, being abundantly provided with black hairs; the digital joint is oval, convex, and hairy externally, concave within, except at the extremity, comprising the palpal organs, which are highly developed, with a prominent, slightly curved process directed forwards, and are of a very dark-brown colour, tinged with red.

This is a common spider on the banks of rivers in Denbighshire and Caernarvonshire. It pairs in May, and in June the female deposits about sixty pale-yellow eggs, of a spherical figure, in a lenticular cocoon of dull-green or yellowish-brown silk, of a compact texture, measuring one fifth of an inch in diameter.

Like other species belonging to the same genus, *Lycosa fluviatilis*, in constructing its cocoon, slightly connects the margins of the two compact portions beneath which the thin fabric of the zone is folded. This simple contrivance affords an admirable provision for the development of the young in the foetal state by an increase in the capacity of the cocoon consequent on the margins of the compact parts becoming detached by means of the expansive force within, the eventual liberation of the young being effected by the rupture of the zone, which is the weakest part. This interesting fact in the economy of the *Lycosæ* appears to have escaped the observation of arachnologists.

The specific name *arenaria*, given by M. Koch to this *Lycosa*, having been previously conferred on another species of the genus by M. Savigny, the trivial name *fluviatilis* is here substituted for it. M. Walckenaer has regarded this species as a variety of *Lycosa vorax* ('Hist. Nat. des Insect. Apt.,' t. i, pp. 313, 314, and t. iv, p. 392), from which it differs in size, in the design formed by the distribution of its colours, and in its habits.

LYCOSA CAMBRICA. Pl. II, fig. 14.

*Lycosa cambrica*, Blackw., Linn. Trans., vol. xviii, p. 614.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 396.

Length of the female,  $\frac{3}{8}$ ths of an inch; length of the cephalo-thorax,  $\frac{3}{16}$ ths; breadth,  $\frac{3}{20}$ ths; breadth of the abdomen,  $\frac{1}{6}$ th; length of a posterior leg,  $\frac{11}{32}$ ths; length of a leg of the third pair,  $\frac{3}{8}$ ths.

The intermediate eyes of the anterior row are rather smaller than the lateral ones. The cephalo-thorax is large, glossy, and of a brownish-black hue; but it is clothed with yellowish-brown hairs, which are densest on the anterior part, and the sides and posterior part are marked with white hairs disposed in irregular spots. The falces are powerful, conical, with a few teeth and a fringe of long hairs on the inner surface; the maxillæ are strong, curved towards the lip, and are obliquely truncated and fringed with hairs at the extremity, on the inner side; the sternum is heart-shaped. The colour of these parts is brownish-black, the maxillæ having a tinge of red at the extremity, and the sternum being thinly covered with long black, and short, yellowish-brown hairs. The legs and palpi are of a dark, yellowish-brown hue, marked with black annuli. The abdomen is rather broader at the posterior than at the anterior extremity, densely covered with hairs, convex above, projecting over the base of the cephalo-thorax; the colour of the upper part is yellowish-brown, a band of a paler hue extending from the anterior part, along the middle, more than a third of its length; this band has an obscure border of black, on which there are several irregular white spots; a series of black and white spots, disposed alternately, commences near the posterior extremity of the band, on each side of the medial line, and extends to the spinners, where the two meet; the



black spots of both series are connected by obscure, black, angular lines, each comprising a white spot within its vertex; the sides are mottled with dull olive-brown, yellowish-brown, and white; and the under part has a yellowish-brown tint; the sexual organs, which have a longitudinal septum in the middle, are of a red-brown colour; and that of the spinners is dark-brown.

The male is smaller and paler than the female; but it resembles her in the general distribution of its colours. The base of the thigh of each anterior leg is black. The axillary and humeral joints of the palpi have a dark-brown hue; the colour of the cubital and radial joints, which are short, is yellowish-brown; and the digital joint has a dark, reddish-brown tint. This last joint is of a slender, elongated, oval form, convex and hairy externally, and concave underneath, near the base; this concavity comprises the palpal organs, which are slightly developed, and of a dark, reddish-brown colour.

Adult males and females of this handsome spider were taken on swampy ground in woods at Oakland, near Llanrwst, in May, 1839. The decidedly curved form of the maxillæ, an approximation to which may be observed in *Lycosa campestris*, *Lycosa allodroma*, and some other species, has not been considered of sufficient importance to require its separation from the genus *Lycosa*, with the semi-aquatic species of which genus it is very closely allied by its general organization, habits, and colours.

In July and August, the female deposits between sixty and seventy spherical eggs of a yellow colour, in a globular cocoon of compact, white silk, which is encircled by a narrow zone of a slighter texture, and measures one fifth of an inch in diameter.

A deficiency of the right intermediate eye of the anterior row has been observed in an adult male of this spider.

M. Walckenaër is certainly mistaken in supposing that *Lycosa cambrica* is identical with *Lycosa allodroma* ('Hist. Nat. des Insect. Apt.,' tom. iv, p. 395), for it is not only much smaller than that species, but its colours, which are dissimilar, constitute by their arrangement a different design both on the cephalo-thorax and abdomen; there is some diversity also in the structure of its palpal organs, and in the relative size of the four minute eyes forming the transverse frontal row.

#### LYCOSA LATITANS. Pl. II, fig. 15.

*Lycosa latitans*, Blackw., Linn. Trans., vol. xviii, p. 612.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 397.

— (*Potamia palustris*, Koch, Die Arachn., Band xv, p. 4, tab. 505, figs. 1415 and 1416.

Length of the female,  $\frac{1}{3}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{1}{4}$ th; length of a posterior leg,  $\frac{7}{30}$ ths; length of a leg of the third pair,  $\frac{1}{4}$ th.

The lateral eyes of the anterior row are smaller than the intermediate ones. The cephalo-thorax is glossy, of a dark-brown hue, with a short, obscure, red-brown line in the middle of its posterior part, and some white hairs on the lateral margins. The falces are conical, armed with a few teeth on the inner surface, and are of a brown hue, tinged with red. The maxillæ resemble the falces in colour, but are paler; and the lip, which is of a dark-brown hue, has a reddish tint at the extremity. The sternum is heart-shaped, and of a reddish-brown colour, the margins being the darkest. The legs and palpi have a yellowish-brown hue, and are marked with obscure, soot-coloured annuli; the posterior pair of legs is the longest, and the other three pairs are nearly equal in length. The abdomen is hairy, convex above, projecting over the base of the cephalo-thorax; it is of a dark-brown colour, tinged with olive, and has a short, obscure, red-brown line at the anterior extremity of the upper part, which appears like a prolongation of the one on the cephalo-thorax; a row of minute, brilliantly white spots extends along each side of the medial line, and numerous white hairs are distributed on the sides and under part; the sexual organs are black and glossy; and the branchial opercula are of a pale, dull-yellow colour.

The male is rather smaller than the female, which it closely resembles in colour. The palpi are slender, and the radial is longer than the cubital joint; the digital joint is of an elongated oval form, convex and hairy externally, concave within, comprising the palpal organs, which are moderately developed, not very complex in structure, with a crescent-shaped process at the extremity, and are of a reddish-brown colour.

Females of this species, which appears to connect the terrestrial with the semi-aquatic *Lycosa*, may be found, in the months of May and June, among moss and under stones in moist situations in the woods of Denbighshire, with their cocoons attached to their spinners. The cocoon is globular, measuring one eighth of an inch in diameter, and is composed of compact, white silk, encircled by a narrow zone of a slighter texture; it comprises forty or fifty yellow eggs, of a spherical form.

*Lycosa latitans* is placed by M. Walckenaer among the synonyma of *Lycosa fumigata* ('Hist. Nat. des Insect. Apt.,' tom. iv, p. 395), but on insufficient grounds, as it is very much smaller than that species, and differs from it in the design formed by the distribution of its colours, which likewise present some diversity.

#### LYCOSA PIRATICA. Pl. II, fig. 16.

*Lycosa piratica*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 339.

— — Hahn, Die Arachn., Band i, p. 107, tab. 27, fig. 80.

— — Sund., Vet. Acad. Handl., 1832, p. 193.

— — Blackw., Linn. Trans., vol. xix, p. 120.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 397.

— (*Potamia*) *piratica*, Koch, Die Arachn., Band xv, p. 1, tab. 505, figs. 1413 and 1414.

— *palustris*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 22.

Length of the female,  $\frac{7}{30}$ ths of an inch; length of the cephalo-thorax,  $\frac{3}{30}$ ths, breadth,  $\frac{1}{3}$ th; breadth of the abdomen,  $\frac{1}{8}$ th; length of a posterior leg,  $\frac{1}{2}$ ; length of a leg of the third pair,  $\frac{1}{30}$ ths.

The intermediate eyes of the anterior row are larger than the lateral ones. The cephalo-thorax is glossy, of a yellowish-brown colour, with a broad, longitudinal, brown band on each side, and a small bifid one of the same hue in the middle, which terminates at the posterior indentation; the lateral margins are supplied with hairs of brilliant whiteness. The falces are powerful, conical, armed with teeth on the inner surface, and, with the maxillæ, are of a red-brown colour, the latter being the paler. The lip is of a dark-brown hue in the middle, and has a reddish-brown tint on the sides and at the extremity. The sternum is heart-shaped, and of a yellowish-brown colour. The legs are provided with hairs and spines, and are of a greenish-brown hue, with the exception of the tarsi, which have a reddish-brown tint; the thighs are the palest, and sometimes present a faint appearance of annuli. The palpi have a greenish-brown colour, the digital joint excepted, which has a reddish-brown hue. The abdomen is hairy, convex above, projecting over the base of the cephalo-thorax; the colour of the upper part is brown, with a yellowish-brown band in the middle of the anterior part, extending more than a third of its length; the lateral margins of this band are bordered by white lines, which pass beyond its extremity, and meet in a point; on each side of the posterior part there is a series of brilliantly white spots, both of which converge towards the spinners; the sides are thickly mottled with white; and the under part has a pale-brown hue; the sexual organs are of a dark, reddish-brown colour; and that of the branchial opercula is yellow.

The sexes are similar in colour; but the male, which is the smaller, has the radial joint of the palpi longer than the cubital, and slightly curved downwards; the digital joint has a reddish-brown hue; it is oval, convex, and hairy externally, concave within, comprising the palpal organs, which are moderately developed, not very complicated in structure, and of a dark, reddish-brown colour.

*Lycosa piratica* frequents marshes and the margins of pools; it runs rapidly on the surface of water, even when encumbered with its cocoon, and frequently takes refuge from danger beneath the surface of that liquid, concealing itself among the leaves of aquatic plants, the air confined by the circumambient water among the hairs with which it is clothed enabling it to remain immersed for a considerable period of time.

In June the female deposits from eighty to one hundred spherical eggs of a deep-yellow colour, in a globular cocoon of compact, white silk, encircled by a narrow zone of a slighter texture, which measures about one fifth of an inch in diameter.



## LYCOSA PISCATORIA. Pl. II, fig. 17.

*Lycosa piscatoria*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. xx, p. 498.

— (*Potamia*) *piscatoria*, Koch, Die Arachn., Band xv, p. 6, tab. 506, figs. 1417-1419.

Length of the female,  $\frac{7}{32}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{12}$ th; breadth of the abdomen,  $\frac{1}{8}$ th; length of a posterior leg,  $\frac{5}{12}$ ths; length of a leg of the third pair,  $\frac{7}{24}$ ths.

The intermediate eyes of the anterior row are larger than the lateral ones. The cephalo-thorax is compressed before, depressed and rounded on the sides, glossy, somewhat hairy, with slight furrows converging from the lateral margins towards a narrow indentation in the medial line; it is of a yellowish-brown colour, with a broad, irregular, olive-brown band extending along each side, and a small bifid one in the middle, whose angular point terminates at the narrow medial indentation. The falcies are powerful, conical, vertical, armed with a few teeth on the inner surface, and, with the maxillæ, are of a reddish-brown hue, the latter being the paler. The colour of the lip is dark-brown in the middle, and reddish-brown at the sides and extremity. The sternum is heart-shaped, and of a dark-brown hue, with a longitudinal, yellowish-brown line in the middle. The legs are provided with hairs and sessile spines, and are of a yellowish-brown colour, with dark-brown annuli. The palpi resemble the legs in colour, but are without annuli. The abdomen is oviform, hairy, convex above, and projects over the base of the cephalo-thorax; the upper part is of a dark-brown hue, with a dentated, red-brown band extending along the middle, which diminishes in breadth as it approaches the spinners; a row of minute white spots, the posterior one being rather the largest, occurs on each side of this band, and its anterior part comprises an oval, red-brown mark bordered with black; there are a few yellowish-gray hairs on the sides, and the under part has a yellow-brown tint; the colour of the sexual organs is dark, reddish-brown, and that of the branchial opercula is yellow.

In their colours and in the design formed by their distribution the sexes are similar, but the male is the smaller. The radial joint of its palpi is rather longer than the cubital, and the digital joint, which has a dark-brown hue, tinged with red, is oval, convex, and hairy externally, concave within, comprising the palpal organs; these organs are highly developed, complicated in structure, with a curved, pale-red process at their extremity, and of a dark, reddish-brown colour.

Mr. R. H. Meade took adult males and females of this species, which is closely allied to *Lycosa piratica*, in the last week of June, 1856, in a swampy piece of ground in Buckinghamshire.

Genus DOLOMEDES (*Latreille*).

*Eyes* unequal in size ; four in front of the cephalo-thorax form a transverse row, the other four, situated in front and on the sides of its anterior part, describe a trapezoid whose posterior side is much the longest.

*Maxillæ* straight, rather enlarged and rounded at the extremity.

*Lip* almost quadrate.

*Legs* long and robust ; the fourth pair is usually the longest, the second pair commonly surpasses the first in length, and the third pair is the shortest.

## DOLOMEDES MIRABILIS. Pl. II, fig. 18.

- Dolomedes mirabilis*, Walek., Hist. Nat. des Insect. Apt., tom. i, p. 356.  
 — — Latr., Gen. Crust. et Insect., tom. i, p. 117.  
 — — Hahn, Die Arachn., Band ii, p. 35, tab. 51, fig. 120.  
 — — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 398.  
*Ocyale* — Sund., Vet. Acad. Handl., 1832, p. 198.  
 — — Koch, Uebers. des Arachn. Syst., erstes Heft, p. 23.  
 — — Koch, Die Arachn., Band xiv, p. 107, tab. 482, fig. 1346.  
 — *rufofasciata*, Koch, Die Arachn., Band xiv, p. 110, tab. 482, fig. 1347.  
 — *murina*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 23.  
 — — Koch, Die Arachn., Band xiv, p. 111, tab. 483, fig. 1348.  
*Titulus* 28, Lister, Hist. Animal. Angl. De Aran., p. 82, tab. 1, fig. 28.

Length of the female,  $\frac{1}{2}$  an inch ; length of the cephalo-thorax,  $\frac{1}{5}$ th, breadth,  $\frac{1}{7}$ th ; breadth of the abdomen,  $\frac{1}{7}$ th ; length of a posterior leg,  $\frac{5}{8}$ ths ; length of a leg of the third pair,  $\frac{13}{20}$ ths.

The cephalo-thorax is short, compressed before, depressed and rounded on the sides, triangular in front, with a narrow indentation in the medial line of the posterior region ; it is thickly covered with hairs of a yellowish-brown colour, which are palest on the sides, and has a narrow, yellowish-white line extending along the middle ; the frontal triangular space is sparingly provided with hairs, and of a reddish-brown colour, its sides having a yellowish-white tint. The intermediate eyes of the anterior row are the smallest, and those constituting the anterior pair of the trapezoid are the largest of the eight. The falces are powerful, conical, armed with two rows of teeth on the inner surface, and of a red-brown hue. The maxillæ

resemble the falces in colour, but are paler; and the lip has a dark-brown hue, with red-brown margins. The sternum is heart-shaped, of a dark-brown colour, with a longitudinal, yellowish-brown band in the middle, and is covered with yellowish-white hairs. The legs are long and robust, and are provided with short hairs and spines; their colour is yellowish-brown, with the exception of the tarsi, which have a dark-brown hue; the fourth pair is the longest, then the second, and the third pair is the shortest; each tarsus is terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base, which is supplied with a few very minute teeth. The palpi are strong, of a yellowish-brown colour, and have a curved, pectinated claw at their extremity. The abdomen is of an oblong oviform figure, projecting a little over the base of the cephalo-thorax, and tapering to the spinners; it is thickly covered with short hairs of a yellowish-brown colour above, and has a series of obscure, angular lines of a darker hue, whose vertices are directed forwards, extending along the middle, and a large angular line of a dull, yellowish-white tint at the anterior extremity; on each side of the upper part there is a longitudinal, sinuous, yellowish-white band, below which the sides have a brownish hue; the under part has a pale, yellowish-white tint, with a few lighter coloured spots interspersed; and the colour of the branchial opercula is brown, their inner margin being tinged with pale-yellow.

The male bears a strong resemblance to the female; but it is rather smaller and more distinctly marked, the lighter shades of colour being much paler, and the darker ones more intense. The cubital and radial joints of the palpi are short; the latter projects a large apophysis from its extremity, on the outer side, which tapers to a curved point, and has a tuft of hairs on its outer part, near the base; the digital joint is oval, hairy, very convex externally, concave within, comprising the palpal organs, which are highly developed, prominent, complicated in structure, with a strong, curved process on the outer side, whose termination constitutes their extremity, and are of a reddish-brown colour.

Both sexes have compound, sessile hairs on various parts of their limbs and body. They present much diversity of tint in their several stages of growth; and the female, after having deposited her eggs, becomes of a dark-gray colour.

Well-wooded districts in England and Wales are the favorite haunts of this handsome spider, which, even in the adult state, varies greatly in colour. The *Ocyale murina* of M. Koch, described by that arachnologist as a distinct species, is merely the female of *Dolomedes mirabilis* after she has exercised her parental functions. In June the female constructs a globular cocoon of dull, yellow-coloured silk, of a compact texture and rough exterior surface, measuring three tenths of an inch in diameter, in which she deposits between 220 and 240 eggs of a spherical form and dull-yellow colour, not agglutinated together. This cocoon, for which she manifests a strong feeling of attachment, is carried underneath the sternum, and retained in that situation by means of the falces and palpi, additional support being usually supplied by silken lines connecting it with the spinners; this latter circumstance, it will be perceived, furnishes a new link in the chain of analogies which connect the genus *Dolomedes* with that of *Lycosa*. When the young are about to quit the cocoon, the female spins a large dome-shaped web among grass or low bushes, under which she retires with her treasure, and her progeny, on being extricated from their silken envelope, cluster together on lines spun by themselves beneath the dome, where they remain till they are capable of providing for their own sustenance.

## DOLOMEDES ORNATUS. Pl. II, fig. 19.

*Dolomedes ornatus*, Blackw., Annals and Mag. of Nat. Hist., third series, vol. iii, p. 91.

Length of the female,  $\frac{1}{10}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{20}$ th, breadth,  $\frac{1}{24}$ th; breadth of the abdomen,  $\frac{1}{20}$ th; length of a posterior leg,  $\frac{1}{7}$ th; length of a leg of the third pair,  $\frac{1}{8}$ th.

The eyes are seated on black spots on the sides and in front of the anterior part of the cephalo-thorax; the four anterior ones are minute, and form a straight, transverse row, the lateral ones, each of which is placed on a minute tubercle, being rather the smallest; the other four are large, and describe a trapezoid whose posterior side is much the longest; the posterior eyes of the trapezoid are seated on tubercles, and the anterior ones are the largest of the eight. The cephalo-thorax is convex, glossy, compressed before, rounded on the sides, and has a slight indentation in the medial line; a broad, brownish-red band, which tapers to its posterior extremity, extends along the middle, and on each side of it there is a longitudinal brown band, which decreases in breadth to the lateral eye of the posterior row; the sides have a pale, dull-yellow hue, that of the lateral margins is black, and a blackish spot occurs on the frontal margin, below each lateral eye of the anterior row. The falces are conical, vertical, and armed with a few teeth on the inner surface; the maxillæ are short, somewhat enlarged and rounded at the extremity, and slightly inclined towards the lip. These organs have a pale, dull yellowish hue; a blackish streak extends along the former, and appears like a continuation of the spot on the frontal margin of the cephalo-thorax. The lip is nearly quadrate, and of a yellowish-brown colour, the sides being much the darkest. The sternum is heart-shaped, and of a pale, dull-yellow hue, with broad, brownish-black lateral margins. The legs are moderately long, provided with hairs and fine spines, and are of a pale-yellowish hue, with minute black spots; the fourth pair is rather the longest, the first and second pairs are equal in length, and the third pair is the shortest; each tarsus is terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base. The palpi resemble the legs in colour, and have a small, curved, pectinated claw at their extremity. The abdomen is oviform, thinly clothed with hairs, convex above, and projects over the base of the cephalo-thorax; the upper part is of a yellowish-brown colour; at its anterior part there are four short, longitudinal streaks, the exterior ones of which increase in breadth to their posterior extremity; to these succeed three large spots placed transversely, the intermediate one being in advance of the other two; and between the latter and the spinners there is a series of short, transverse bars, somewhat enlarged at their extremities, which decrease in length to the coccyx; these streaks, spots, and bars have a brown hue; the sides and under part are of a pale-yellowish colour; the former are slightly tinged with brown, and a longitudinal, brownish-black band occurs on each side of the medial line of the latter; these bands converge to the spinners, where they meet.

The Rev. O. P. Cambridge took two young females of this species, at Lyndhurst, in the New Forest, Hampshire, in September, 1858.



## DOLOMEDES FIMBRIATUS. Pl. II, fig. 20.

*Dolomedes fimbriatus*, Walck. Hist. Nat. des Insect. Apt., tom. 1, p. 345.

- — Latr., Gen. Crust. et Insect., tom. i, p. 118.
- — Hahn, Die Arachn., Band i, p. 14, tab. 4, fig. 10.
- — Sund., Vet. Acad. Handl., 1832, p. 194.
- — Koch, Uebers. des Arachn. Syst., erstes Heft, p. 23.
- — Blackw., Linn. Trans., vol. xix, p. 120.
- — Koch, Die Arachn., Band xiv, p. 116, tab. 485, figs. 1352 and 1353.
- — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 398.
- *limbatus*, Hahn, Die Arachn., Band i, p. 15, tab. 4, fig. 11.
- *marginatus*, Hahn, Die Arachn., Band i, p. 15, tab. 4, fig. 12.

Length of the female,  $\frac{3}{8}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{3}$ rd, breadth,  $\frac{2}{10}$ ths; breadth of the abdomen,  $\frac{2}{3}$ ths; length of a posterior leg,  $1\frac{2}{10}$ ths; length of a leg of the third pair,  $1\frac{1}{20}$ th.

This spider ranks among the largest British species. The lateral eyes of the anterior row are the smallest, those constituting the anterior pair of the trapezoid are the largest, and each eye of the posterior pair is seated on a tubercle. The cephalo-thorax is compressed before, depressed and rounded on the sides, hairy, with furrows converging from the lateral margins towards the middle, and a longitudinal indentation in the posterior region; its colour is dark-brown, a yellowish-brown band extending along each side. The falces are powerful, conical, armed with teeth on the inner surface, and of a dark, reddish-brown colour. The maxillæ are strong, and, with the lip, are of a reddish-brown hue. The sternum is heart-shaped and somewhat paler than the maxillæ. The legs are robust, provided with hairs and spines, and are of a reddish-brown hue, being palest underneath; the fourth pair is the longest, the second rather surpasses the first in longitudinal extent, and the third pair is the shortest; each tarsus is terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base. The palpi resemble the legs in colour, and have a curved, pectinated claw at their extremity. The abdomen is oviform, densely covered with hairs, convex above, projecting over the base of the cephalo-thorax; it is of a dark-brown colour on the upper part, with an obscure row of whitish spots on each side of the medial line, which are sometimes obliterated, and a longitudinal band of a yellowish-brown hue on each side; the under part is of a deep, yellowish-brown colour; and the sexual organs have a dark, reddish-brown tint.

In the earlier periods of its existence, the legs and palpi of this species are of a dull-greenish hue, the cephalo-thorax and upper part of the abdomen are of a dark, olive-brown colour, and the lateral bands are white.

The male is smaller, slenderer, and more distinctly marked than the female. The palpi are provided with strong spines, and the radial joint projects three apophyses from its extremity; one, on the outer side, is terminated by several points; a strong, pointed one is situated underneath; and intermediate between these two, towards the outer side, there is another, which is obtuse, and is supplied with long hairs forming a dense tuft; the digital joint is of an oblong-oval form, convex and hairy externally, compact at the extremity, and concave within, at the base; this concavity comprises the palpal organs, which are moderately developed, complicated in structure, with a slender, curved, pointed spine at their extremity, directed from the inner to the outer side, and consist of dark, reddish-brown, and yellowish parts intermixed.

In the fens of Cambridgeshire this fine spider is of frequent occurrence. Like *Lycosa piratica*, it descends spontaneously beneath the surface of water, the period of time during which it can respire when immersed depending upon the supply of air enveloping its body. In May the female deposits several hundred eggs in a globular cocoon of brown silk of a compact texture, measuring three fifths of an inch in diameter, which she carries under the sternum, supporting it there by the instrumentality of the falces and palpi.

The *Dolomedes limbatus* and *Dolomedes marginatus* of M. Hahn are immature individuals of this species.

*Genus* HECAERGE (*Blackwall*).

*Eyes* unequal in size, disposed in two transverse rows on the anterior part of the cephalothorax; four constituting the anterior row, which is slightly curved backwards, are adjacent and minute: the posterior row is greatly curved, with its convexity directed forwards; it comprises the other four eyes, which are large and separated by moderately wide intervals.

*Maxillæ* short, strong, convex on the under side, enlarged at the base, where the palpi are inserted, rounded at the extremity, and inclined towards the lip.

*Lip* small, triangular, and truncated at the apex.

*Legs* robust; the fourth pair is the longest, then the first, the third pair being the shortest.

HECAERGE SPINIMANA. Pl. III, fig. 21.

*Hecaërge spinimana*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 399.

— *maculata*, Blackw., Lond. and Edinb. Phil. Mag., third series, vol. iii, p. 193.

— — Blackw., Research. in Zool., p. 413, pl. 3, fig. 8.

*Lycæna spinimana*, Sund., Vet. Acad. Handl., 1832, p. 266.

*Lycodia* — Sund., Consp. Arachn., p. 22.

*Dolomedes lycæna*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 348.

*Zora spinimana*, Koch, Die Arachn., Band xiv, p. 102, tab. 481, figs. 1343 and 1344.

Length of the female,  $\frac{1}{4}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{12}$ th; breadth of the abdomen,  $\frac{1}{10}$ th; length of a posterior leg,  $\frac{3}{8}$ ths; length of a leg of the third pair,  $\frac{1}{4}$ th.

The cephalo-thorax is oval, hairy, depressed in the posterior region, and pointed before; its colour is pale, yellowish-brown, with a broad, dark-brown band extending along each side, and two fine lines of the same hue on the lateral margins; a few white hairs, directed forwards, occupy the space between the two intermediate pairs of eyes, and immediately below the anterior row of eyes there is a small, transverse, dark, red-brown line. The intermediate eyes of the anterior row are larger than the lateral ones. The falces are small, conical, armed with a few minute teeth on the inner surface, and are of a pale, yellowish-brown colour, with a dark-brown, elongated spot in front, which is palest in the medial line. The maxillæ have a pale, yellowish-brown hue, that of the lip being dark-brown bordered with pale-brown. The sternum is heart-shaped, and of a pale-yellow colour faintly tinged with green; eight dark-brown spots occur on its margins; one, which is very minute, and is sometimes wanting altogether, is situated opposite to the lip; three are disposed on each side; and one is seated on its posterior extremity. The legs are hairy, and are furnished with strong spines; the thighs and tarsi are of a pale, yellowish-brown colour, the former having several longitudinal, dark-brown lines on the upper and outer sides, which are most conspicuous on the first and second pairs, and some minute spots of the same hue underneath; the tibiæ and metatarsi are of a dark-brown colour, those of the first and second pairs of legs being provided with a series of long, moveable, sessile spines on each side of the inferior surface; the tarsi have two long, curved claws at their extremity, each of which has three minute teeth, the terminal one being the longest, and below them there is a small scopula. The palpi, which are of a pale, yellowish-brown colour, are supplied with a few spines, and are terminated by a long, curved claw having three very small teeth underneath. The abdomen is oviform, hairy, broader at the posterior than at the anterior extremity, convex above, projecting over the base of the cephalo-thorax; the upper part is of a pale, yellowish-brown colour, mingled with white, and has three small tufts of white hairs in front; two obscure, brownish-black streaks, one on each side of the medial line, extend from the anterior part almost a third of its length, and are succeeded by a series of brownish-black spots occupying the remainder of the medial line, on each side of which there is a longitudinal row of very small spots of the same hue; these streaks and spots are included between two irregular, brownish-black bands, composed principally of spots, confluent or nearly so, diminishing in size as they approach the spinners; the sides and under part of the abdomen have a pale, yellowish-brown hue, spotted with black, the spots on the latter being minute; and the branchial opercula are of a yellowish-brown colour, with pale inner margins.

The male is smaller and darker coloured than the female. The cubital and radial joints of the palpi are short, a small, pointed apophysis projecting from the extremity of the latter, on the outer side; the digital joint is oval, convex, and hairy externally, concave within, comprising the palpal organs, which are highly developed, with a curved, spine-like process extending to the termination of the joint, and are of a red-brown colour.

The young of both sexes resemble the mother; but their colours are darker, and the brown bands and lines on the cephalo-thorax are broader.

*Hecaërge spinimana* occurs in woods in various parts of Great Britain; it is active in its movements, and being provided with scopulæ, can run with facility on dry objects having polished perpendicular surfaces. In June the female constructs a lenticular cocoon of white silk of a slight texture, measuring about three tenths of an inch in diameter, which she usually attaches to the under side of a stone, depositing in it between twenty and thirty spherical eggs of a yellowish-white colour, not agglutinated together.

Scotch specimens of this spider have been received from Mr. J. Hardy.

In its general organization this species approximates most nearly to the spiders belonging to the genus *Dolomedes*, among which it is still retained by M. Walckenaer; the propriety of constituting a new genus for its reception is rendered sufficiently manifest, however, by differences in the disposition of its eyes, in the structure of its mouth and legs, and also in its habits and economy. These differences present distinct characters, admitted to be generic by Professor Sundevall and M. Koch; indeed the generic name *Lycæna*, proposed by the former eminent arachnologist, would have taken precedence of all others had it not been previously employed by Fabricius.

*Genus* SPHASUS (*Walckenaer*).

*Eyes* unequal in size, disposed on the anterior part of the cephalo-thorax; the four posterior ones form a transverse row, which is greatly curved, having its convexity directed backwards; and the other four describe a trapezoid whose shortest side is before; the posterior eyes of the trapezoid are the largest, and the anterior ones much the smallest of the eight.

*Maxillæ* long, straight, and somewhat enlarged and rounded at the extremity.

*Lip* moderately long and dilated towards its apex.

*Legs* long and slender, varying in their relative length in different species.

SPHASUS LINEATUS. Pl. III, fig. 22.

*Sphasus lineatus*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 375.

— — Walck., Hist. Nat. des Insect. Apt., tom. ii, p. 460.

— — Koch, Die Arachn., Band iii, p. 12, tab. 77, figs. 171, 172.

*Oxyopes* — Latr., Gen. Crust. et Insect., tom. i, p. 117, tab. 5, fig. 5.

Length of the female,  $\frac{1}{4}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{1}{10}$ th; length of an anterior leg,  $\frac{5}{12}$ ths; length of a leg of the third pair,  $\frac{1}{3}$ rd.



The legs are provided with hairs and long spines, and have a brownish-yellow hue, with brown streaks, spots, and annuli; the first pair is the longest, then the second, and the third pair is the shortest; each tarsus is terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base. The palpi resemble the legs in colour, and have a curved, pectinated claw at their extremity. The cephalo-thorax is oval, convex, glossy, with an indentation in the medial line; it is of a dark-brown colour, the margins, a band in the posterior region, which is bifid before, and a short streak behind each lateral eye of the posterior row, being of a yellowish-brown hue; on the frontal margin, immediately below the eyes, there are two vertical, brown streaks whose superior extremity is the broadest. The falces are subcylindrical, vertical, and, with the maxillæ, of a brownish-yellow colour; a brown streak, which seems like a continuation of those on the frontal margin, extending along their entire length. The lip and sternum are of a dark-brown hue, a longitudinal line in the middle of the latter, which is heart-shaped, and the apex of the former being of a yellowish-brown colour. The abdomen is oviform, tapering to the spinners; it is convex above, projecting over the base of the cephalo-thorax, and of a dark-brown colour; in the medial line of the anterior extremity of the upper part there is an obscure, oval, yellowish-brown spot, encompassed by a dark-brown line, which is bounded by a pale-yellow one, and between the oval spot and the spinners there is a series of small, yellowish-brown spots, that which terminates the series at the coccyx being the palest and most conspicuous; on the upper part of each side there are three pale-yellow lines; the anterior one is longitudinal, and the two succeeding ones are oblique; the branchial opercula have a brownish-yellow colour, and a line of the same hue extends from each to the spinners. White and yellowish-white scale-like hairs occur on various parts of this spider.

The male bears a close resemblance to the female, but is somewhat smaller and darker coloured. The radial joint of the palpi is much larger than the cubital; it has a long process at its base, on the outer side, which is depressed and rounded at the extremity, with a small, acute projection at its superior surface, and a large, obtuse apophysis projects from the extremity of the joint, on the under side; the digital joint is pyriform, with a large lobe near its base, on the inner side, and has a very dark-brown hue; it is convex, and hairy externally, concave within, comprising the palpal organs, which are highly developed, not very complicated in structure, prominent at the base, somewhat pointed at the extremity, and of a dark-brown colour, with pale, reddish-brown intermixed.

Young females of this species were captured by the Rev. O. P. Cambridge, at Lyndhurst, in the New Forest, in September, 1858.

*Family* SALTICIDÆ.

This family includes spiders conspicuous for the brilliancy, iridescence, variety, and disposition of their colours, and also for the singularity of their forms. The falces are articulated either vertically or on an inclined plane; three pairs of spinners occur at the termination of the abdomen, and two branchial opercula near the anterior part of its inferior surface. The legs, which are constructed for running and leaping, vary greatly in their relative proportions, and, in numerous instances, are terminated by two tarsal claws, below which a small scopula is situated; but the tarsi of some species are supplied with three claws and are devoid of scopulæ.

The geographical distribution of the *Salticidæ* is very extensive; their principal haunts are the leaves of trees and shrubs, crevices in rocks and walls, and interstices among stones; and they take their prey by surprise, frequently springing upon it from a distance. Comprised in this family are the spiders constituting the genus *Salticus*; in number they exceed those of any other genus in the order *Araneidea*, and many of them employ their palpi as brushes to cleanse the corneous coat of the anterior eyes.

*Genus* ERESUS (*Walckenaer*).

*Eyes* unequal in size, disposed on the anterior part and sides of the cephalo-thorax; the four exterior ones constitute a large quadrilateral figure, which includes a small trapezoid described by the four intermediate ones, whose anterior side is the shortest, and with the anterior eyes of the quadrilateral figure forms a transverse row in front.

*Maxillæ* straight, enlarged, and rounded at the extremity.

*Lip* triangular and pointed at the apex.

*Legs* powerful, moderately long, and not very unequal in length.

## ERESUS CINNABARINUS. Pl. III, fig. 23.

- Eresus cinnabarinus*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 395.  
 — — Latr., Gen. Crust. et Insect., tom. i, p. 121.  
 — — Koch, Die Arachn., Band iv, p. 106, tab. 138, fig. 318.  
 — — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 400.  
 — *quadriguttatus*, Hahn, Die Arachn., Band i, p. 45, tab. 12, fig. 35.  
 — — Koch, Die Arachn., Band iv, p. 104, tab. 138, fig. 316.  
 — — Koch, Uebers. des Arachn. Syst., erstes Heft, p. 35.  
 — *annulatus*, Hahn, Die Arachn., Band i, p. 47, tab. 12, fig. 36.  
 — — Koch, Die Arachn., Band xiii, p. 14, tab. 435, fig. 1087.  
 — *illustris*, Koch, Die Arachn., Band iv, p. 105, tab. 138, fig. 317.

Length of the female,  $\frac{1}{3}$ rd of an inch.

The posterior eyes of the four constituting the small trapezoid included in the quadrilateral figure described by the other four are the largest of the eight. The cephalo-thorax is large, rounded on the sides, and convex before; it is black, with a red band on the posterior part of each lateral margin, which tapers to its anterior extremity. The falcæ are short, powerful, conical, and vertical; these organs, with the maxillæ, lip, and sternum, are black. The legs are robust, hairy, and black, with white annuli at the articulation of the joints, the thighs of the second, third, and fourth pairs being commonly clothed with red hairs; the fourth pair is the longest, then the first, and the third pair is the shortest. The palpi are short, strong, hairy, and black, having, like the legs, white annuli at the articulation of the joints. The abdomen is oviform, depressed, densely covered with short hairs, and projects over the base of the cephalo-thorax; on the upper part, which is of a bright-red colour, there are four conspicuous black spots, encircled with white hairs, forming a square; and in some instances an additional pair of small spots of the same hue occurs in the space between the square and the spinners; the under part is black, with the exception of a white spot near its posterior extremity, and the branchial opercula, which are covered with red hairs.

The male may be distinguished from the female by its smaller size, and by the structure of its palpi; the digital joint is oval, convex, and hairy externally, concave within, comprising the palpal organs, which are moderately developed, prominent, conical, and somewhat pointed.

The colour of the legs and the number of black spots on the upper part of the abdomen are not constant in this species, which is admitted as British on the authority of Dr. Leach. See the Supplement to the fourth, fifth, and sixth editions of the 'Encyclopædia Britannica,' article Annulosa.

Genus SALTICUS (*Latreille*).

*Eyes* disposed in three rows, constituting three sides of a square, in front and on the sides of the cephalo-thorax; the two intermediate eyes of the anterior row are the largest, and the intermediate eye of each lateral row is much the smallest of the eight.

*Maxillæ* short, straight, enlarged at the base, where the palpi are inserted, and at the extremity, which is rounded.

*Lip* oval, obtuse at the apex.

*Legs* robust, varying considerably in their relative length in different species.

## SALTICUS SCENICUS. Pl. III, fig. 24.

*Salticus scenicus*, Latr., Gen. Crust. et Insect., tom. i, p. 123.

— — Hahn, Die Arachn., Band i, p. 57, tab. 15, figs. 43, 44.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 400.

*Attus* — Walck., Hist. Nat. des Insect. Apt., tom. i, p. 406.

— — Sund., Vet. Acad. Handl., 1832, p. 202.

*Calliethera scenica*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 31.

— — Koch, Die Arachn., Band xiii, p. 37, tab. 439, figs. 1106, 1107.

— *histrionica*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 31.

— — Koch, Die Arachn., Band xiii, p. 42, tab. 439, figs. 1110, 1111.

*Titulus* 31, Lister, Hist. Animal. Angl. De Aran., p. 87, tab. 1, fig. 31.

Length of the female,  $\frac{1}{4}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{13}$ th; breadth of the abdomen,  $\frac{1}{10}$ th; length of a posterior leg,  $\frac{1}{3}$ th; length of a leg of the second pair,  $\frac{1}{7}$ th.

The legs are hairy, and of a yellowish-brown colour, marked with brownish-black annuli; the fourth pair is the longest, then the third, which a little exceeds the first in length, and the second pair is the shortest; each tarsus is terminated by two curved, pectinated claws, below which there is a scopula. The palpi are short, hairy, and have a yellowish-white tint, with the exception of the axillary joint, which has a dark-brown hue. The cephalo-thorax is thinly covered with hairs, somewhat quadrilateral, abruptly sloping behind, prominent in front, projecting beyond the falces; it is black, bordered with white, except on the posterior margin, and has a white spot near each posterior eye. The falces are conical, gibbous in front, vertical, and armed with a few teeth on the inner surface; the sternum is oval and



sparingly clothed with white hairs. These parts are black. The maxillæ and lip have a dark-brown hue, the former, which are the lighter coloured, being palest at the extremity, on the inner side. The abdomen is oviform, hairy, slightly depressed, projecting over the base of the cephalo-thorax; the upper part is of a brown colour, with some reddish-brown and white hairs interspersed; three oblique, white bands occur on each side, a white spot is situated immediately above the spinners, and a curved, white band at the anterior extremity passes obliquely to the under side, which has a grayish-white hue: the colour of the branchial opercula is brown; and that of the spinners and sexual organs dark-brown.

The male is smaller and darker coloured than the female, and the relative length of its legs is different; the first and fourth pairs are the longest and equal in length, and the second pair is the shortest; their colour is dark-brown, the thighs being almost black. The falces, which have a dark-brown hue, are remarkably long, subcylindrical, very prominent, widely divergent at the extremity, and are armed with a long, slightly curved fang, a large pointed process near the extremity, on the outer side, and two minute teeth on the inner side, the smaller of which is nearer the base than the extremity. The palpi have a dark-brown hue; the humeral joint is curved downwards, and the radial joint, which is shorter than the cubital, projects a large apophysis from its extremity, on the outer side; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs, which are moderately developed, prominent at the upper part, not complex in structure, and of a dark-brown colour.

When searching on walls or the trunks of trees for those insects which constitute its food, this common spider employs much art, moving with great circumspection, and occasionally elevating the cephalo-thorax, by straightening the anterior legs, for the purpose of extending its sphere of vision. It runs without difficulty on the perpendicular surfaces of dry, polished bodies, having, like the other species of the genus, scopulæ situated below the tarsal claws, which, by the emission of an adhesive secretion, give it a secure hold upon objects. It takes its victims by surprise, leaping suddenly upon them, and by that act draws from the spinners a line attached by its extremity to the station whence it took its spring,—a necessary precaution to prevent the possibility of falling, whether successful in seizing its prey or not.

In June the female constructs one or two cocoons of white silk, of a slight texture and lenticular form; the larger ones measure about one fifth of an inch in diameter, and usually contain fifteen or sixteen spherical eggs of a pale-yellow colour, which, in common with those of the *Saltici* generally, are not agglutinated together. These cocoons are comprised in a cell of compact, white silk, fabricated in crevices of rocks, walls, and the bark of old trees, in which the female also frequently occupies a place.

By subdividing the extensive genus *Salticus*, M. Koch has obtained several minor groups which he has dignified with generic appellations; but as even the species regarded as types of his new genera are, for the most part, connected by close ties of affinity, it is not probable that his views will be adopted by arachnologists generally. The genera *Calliethera*, *Heliophanus*, *Euophrys*, and *Marpissa*, including species indigenous to Great Britain, present differences in structure of importance as affording specific characters, but much too slight and circumscribed to be rendered available in promoting the systematic changes proposed to be made by M. Koch.

Inhabits Scotland and Ireland.

SALTICUS 'SPARSUS. Pl. III, fig. 25.

*Sallicus sparsus*, Blackw., Research. in Zool., p. 417.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii,  
p. 401.

*Titulus* 32, Lister, Hist. Animal. Angl., De Aran., p. 89, tab. 1, fig. 32.

Length of the female,  $\frac{1}{3}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{11}$ th, breadth,  $\frac{1}{14}$ th; breadth of the abdomen,  $\frac{1}{12}$ th; length of a posterior leg,  $\frac{1}{4}$ th; length of a leg of the second pair,  $\frac{1}{7}$ th.

The legs are robust, hairy, and black, with reddish-brown annuli, on which white hairs occur; the fourth pair is much the longest, and the first, second, and third pairs are nearly of equal length, the second pair being rather the shortest; each tarsus has two long, curved, pectinated claws at its extremity. The palpi are short; they resemble the legs in colour, and the radial and digital joints are abundantly provided with long, white hairs. The cephalo-thorax is nearly quadrilateral; it slopes abruptly in the posterior region, and the anterior part is prominent, projecting beyond the falcæ; above it is clothed with black hairs interspersed with yellowish-white ones, which, in some individuals, form an obscure spot between the posterior pair of eyes. The falcæ are small, vertical, armed with a few minute teeth on the inner surface, and are of a dark, reddish-brown colour. The maxillæ and lip have a dark-brown hue, their extremities being the palest. The sternum is oval, with a small prominence on each side of its anterior part; it is sparingly supplied with white hairs, and is of a dark-brown hue. The abdomen is ovate, hairy, somewhat depressed, pointed behind, and projects over the base of the cephalo-thorax; above it is of a brownish-black colour, blended with white, and on each side of the medial line, rather nearer to the posterior than the anterior extremity, there is a conspicuous, irregular, white spot, between which and the spinners there is a series of obscure, whitish lines, of an angular form, whose vertices are directed forwards, and a white spot is situated immediately above the spinners; a tuft of white hairs occurs at its anterior extremity, and the sides have a grayish tint, with a few white spots in the posterior region; the hue of the under part is gray, and that of the branchial opercula brown.

The male does not differ from the female in the relative length of its legs, and it resembles her in colour; but its abdomen is smaller in proportion to the size of the cephalo-thorax. The cubital and radial joints of the palpi are short; the latter projects two obtuse apophyses from its extremity, one situated in front, and the other, which is much the larger, on the outer side; the digital joint is oval, convex, and hairy externally, concave within, comprising the palpal organs, which are highly developed, not very complex in structure, and of a dark, red-brown colour.

Specimens of this spider were captured on the outer walls of Crumpsall Hall, near Manchester, in the summer of 1828. It pairs in the month of May.

## SALTICUS CORONATUS. Pl. III, fig. 26.

*Salticus coronatus*, Blackw., Linn. Trans., vol. xix, p. 121.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 401.

— *abietis*, Hahn, Die Arachn., Band i, p. 61, tab. 16, fig. 46.

— *Blancardii*, Hahn, Die Arachn., Band i, p. 64, tab. 16, fig. 48.

*Attus coronatus*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 412.

— *falcatus*, Sund., Vet. Acad. Handl., 1832, p. 213.

*Euophrys falcata*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 33.

— — Koch, Die Arachn., Band xiv, p. 24, tab. 472, figs. 1290—1295.

*Titulus* 34, Lister, Hist. Animal. Angl., De Aran., p. 91.

Length of the female,  $\frac{7}{34}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{11}$ th; breadth of the abdomen,  $\frac{1}{3}$ th; length of a posterior leg,  $\frac{1}{4}$ th; length of a leg of the second pair,  $\frac{3}{16}$ ths.

The legs are robust, provided with hairs and spines, and of a pale, reddish-brown colour, with dark-brown annuli; the fourth pair is the longest, then the third, and the second pair is the shortest; each tarsus is terminated by two curved, pectinated claws. The palpi are short, and resemble the legs in colour. The cephalo-thorax is large, and nearly quadrilateral; it slopes abruptly in the posterior part, is prominent in front, and projects beyond the falces; its colour is very dark-brown, the region of the eyes being encompassed by a red-brown band, clothed with red-brown and yellowish-white hairs intermixed, and the interval between the eyes is supplied with long black and short red-brown hairs. The falces are strong, conical, gibbous in front, near the base, vertical, and armed with a few teeth on their inner surface; these organs and the maxillæ are of a red-brown colour. The lip and sternum, which is oval, have a dark-brown hue, the former being tipped with yellowish-brown and the latter thinly clothed with whitish hairs. The abdomen is oviform, somewhat depressed, thickly covered with hairs, and projects over the base of the cephalo-thorax; the upper part is of an olive-brown colour, with a few longitudinal, dark-brown streaks in the medial line, and some oblique ones of a larger size on each side of it; the whole is surrounded by an obscure, yellowish-brown band, below which the sides have a dark-brown hue; the under part is of a dull, yellowish-brown colour, with a faint, longitudinal, brown band in the middle; the branchial opercula have a dull-yellow hue, and that of the sexual organs is dark, reddish-brown.

The male is smaller than the female, and the relative length of its legs is different, the third and fourth pairs being equal in length, the first pair a little shorter, and the second pair the shortest. The red-brown band encompassing the eyes is densely covered with yellowish-white hairs, and its extremities, which are curved, extend to the posterior part of the cephalo-thorax. The thighs of the first pair of legs have a black hue, and that of the tibiæ is dark-brown, the genual joint having a reddish-brown tint. The thighs of the second, third, and fourth pairs of legs are black, with a greater or less space of a pale, reddish-brown colour at the base. The humeral joint of the palpi is of a dark-brown hue, the other joints having a pale, reddish-brown tint; the radial, which is rather larger than the cubital joint, projects a long, obtuse, dark-brown apophysis from its extremity, on the outer

side; the digital joint is oval, convex, and hairy externally, concave within, comprising the palpal organs, which are highly developed, prominent at the upper part, not complex in structure, and of a dark-brown colour. A broad, irregular, red-brown band, crossed about one third of its length above the spinners by a curved, yellowish-white line, extends along the middle of the upper part of the abdomen; it is bordered by a black band, and the whole is surrounded by a yellowish-white one, below which the sides are black, and the under part is of a dull, yellowish-brown colour. Sometimes the colour of the broad, irregular band extending along the middle of the upper part of the abdomen is of a yellowish-brown hue, and the curved, transverse, yellowish-white line is almost obliterated.

The sexes of *Salticus coronatus*, which is common in the woods of Denbighshire and Caernarvonshire, differ so greatly in colour, that they have been described as distinct species. They pair early in June.

Specimens of both sexes have been received from Mr. J. Hardy, who took them in Scotland.

## SALTICUS XANTHOGRAMMA.

*Salticus xanthogramma*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 401.

*Attus* — Walck., Hist. Nat. des Insect. Apt., tom. i, p. 415.

*Titulus* 33, Lister, Hist. Animal. Angl., De Aran., p. 90.

The attempt to identify the "*Araneus subflavus, oculis smaragdinis, item cui secundum clunes tres virgulæ croceæ*," of Lister ('De Aran.,' tit. 33, p. 90), either with the *Attus xanthogramma* or the *Attus tripunctatus* of M. Walckenaer, who has referred it to both ('Hist. Nat. des Insect. Apt.,' tom. i, pp. 415—418), is attended with difficulty in consequence of the brevity of the descriptions and the want of specimens to compare with those species. It differs from both in some particulars, but, on the whole, appears to resemble the former more than the latter.

The following is a summary description, from the Latin of Lister:

This spider is of a medium size, and for the most part of a yellowish colour. The cephalothorax is large, nearly quadrate, very flat, and broadest in front. In the relative size and arrangement of its eyes it resembles its congeners, and their colour is emerald-green. The abdomen is sub-cylindrical and pointed at the posterior extremity; it has three conspicuous, saffron-coloured streaks in the medial line of the upper part, and is whitish underneath. The male has the first pair of legs robust, hairy, and longer than the rest, the third pair being the shortest. The digital joints of the palpi are tumid, and mask the falces, which are of a reddish-black colour.



## SALTICUS FRONTALIS. Pl. III, fig. 27.

*Salticus frontalis*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 402.

— *rufifrons*, Blackw., Research. in Zool., p. 420.

— *maculatus*, Wider, Museum Senckenb., Band i, p. 278, taf. 18, fig. 10.

*Attus frontalis*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 415.

— — Koch, Die Arachn., Band xiv, p. 44, tab. 474, figs. 1304, 1305.

Length of the female,  $\frac{1}{8}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{12}$ th, breadth,  $\frac{1}{18}$ th; breadth of the abdomen,  $\frac{1}{18}$ th; length of a posterior leg,  $\frac{1}{6}$ th; length of a leg of the second pair,  $\frac{1}{8}$ th.

The legs are robust, hairy, and of a yellowish-brown colour; the fourth pair is the longest, then the third, and the second pair is the shortest; on the under side of the tibiæ and metatarsi there are some sessile spines, those on the first and second pairs being the most conspicuous; and each tarsus is terminated by two slender, curved, plain claws. The palpi, which resemble the legs in colour, have a short, dark, longitudinal streak on the anterior part of the radial joint. The cephalo-thorax is nearly quadrilateral; it slopes abruptly behind, projects a little beyond the falces, in front, and is clothed with hairs, which are densest on the anterior part; its colour is yellowish-brown, the region of the eyes and the lateral margins being blackish, and the eyes are encircled by red hairs. The falces are small, conical, vertical, armed with a few teeth on the inner surface, and, with the maxillæ, are of a yellowish-brown colour, tinged with red. The lip is triangular, pointed at the apex, and of a brown hue, with yellowish-brown margins; and the sternum, which is oval, is provided with long, dark-coloured hairs, and has a yellowish-brown tint. The abdomen is oviform, hairy, rather depressed, and projects over the base of the cephalo-thorax; it is of a yellowish-brown colour, with numerous, irregular, black streaks on the sides and upper part; a series of black marks, somewhat of a triangular form, occupies the medial line, and two longitudinal rows of black spots extend along the under part. The sexual organs have a reddish tint, with two small, circular spots of a darker hue; and the colour of the branchial opercula is pale-brown, tinged with yellow.

The male is smaller and darker coloured than the female. Its cephalo-thorax has a brown hue, the lateral margins being almost black, and is clothed with orange-brown hairs, which are densest on the anterior part. The falces are of a dark-brown colour, with red-brown extremities; and the maxillæ, sternum, and lip have a brown hue, the last being the darkest. The anterior legs are powerful and black, with the exception of the tarsi, which are white, and in longitudinal extent are equal to the third pair; the third and fourth pairs have a reddish-brown hue, and the colour of the second pair is the same, except that the under part of the femora, tibiæ, and metatarsi, is black, and the tarsi have a yellowish-white tint. The humeral joint of the palpi is clavate, and of a brownish-black hue, with some strong bristles at its extremity; the cubital and radial joints are short, and of a pale, yellowish-brown colour, the latter having a

dark, red-brown spot in front ; both are supplied with coarse, white hairs on the upper side, those on the radial joint being the longer ; the digital joint is of a reddish-brown hue, and has some long, coarse, white hairs on the upper part, towards the inner side ; it is of an oval form, convex and hairy externally, concave within, comprising the palpal organs, which are highly developed and very prominent, extending to the articulation of the cubital with the radial joint ; they have a slender, blackish spine, curved into a circular form, at their extremity, and are of a pale-flesh colour. In a state of repose the palpi mask the falces, and the coarse, white hairs with which they are provided form an obtuse, curvilinear angle, whose vertex is directed downwards. The abdomen is slenderer and less distinctly marked than that of the female, and its colour is darker.

Specimens of this spider, which is partial to well-wooded districts, have been procured in Denbighshire, Caernarvonshire, Yorkshire, and Lancashire. In June the female constructs an oval cell of white silk, of a slight texture, usually attached to the inferior surface of stones or withered leaves, in which she deposits about sixteen spherical eggs, of a pale-yellow colour, connected by fine lines of silk.

SALTICUS OBSCURUS. Pl. III, fig. 28.

*Salticus obscurus*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. vi, p. 336.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 402.

Length of the male,  $\frac{1}{8}$ th of an inch ; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{20}$ th ; breadth of the abdomen,  $\frac{1}{10}$ th ; length of a posterior leg,  $\frac{1}{9}$ th ; length of a leg of the third pair,  $\frac{1}{12}$ th.

The legs are short, robust, and of a reddish-brown colour, the metatarsi and tarsi being the palest ; the fourth pair is rather the longest, then the first, and the third pair is the shortest ; the femora, genua, and tibiæ of the anterior pair of legs are remarkably powerful, the first being very convex on the upper part, and the last densely covered with hairs on their inferior surface ; each tarsus is terminated by two curved claws. The palpi are short, and similar in colour to the legs. The radial joint is smaller than the cubital, and projects a pointed apophysis from its extremity, on the outer side ; the digital joint is large, oval, convex, and hairy externally, concave within, comprising the palpal organs, which are highly developed, very prominent at the base, provided with a black spine curved into a circular form at their extremity, on the outer side, and are of a red-brown colour. The cephalo-thorax is large, sparingly clothed with white hairs, nearly quadrilateral, and projects a little beyond the base of the falces, which are small, conical, and vertical ; the sternum is oval. These parts, with the maxillæ and lip, are of a dark, reddish-brown hue. The abdomen is oviform, convex above, projecting over the base of the cephalo-thorax ; it is of a very dark, reddish-brown colour, a few white hairs being distributed over its upper surface, and on each side of the medial line,

at its anterior extremity, there is a short, longitudinal streak, composed of white hairs, which is not very conspicuous.

An adult male of this minute *Salticus* is in the extensive collection of British *Araneidea* belonging to Francis Walker, Esq., of Arno's Grove, Southgate, Middlesex, in which locality it was taken in May, 1848. Mr. Walker has very liberally permitted descriptions to be made and published of any species comprised in his collection which were suspected to be unknown to arachnologists.

SALTICUS DISTINCTUS. Pl. III, fig. 29.

*Salticus distinctus*, Blackw., Linn. Trans., vol. xviii, p. 616.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 446.

*Euophrys tigrina*, Koch, Die Arachn., Band xiv, p. 6, tab. 469, figs. 1275—1277.

Length of the female,  $\frac{1}{8}$ th of an inch ; length of the cephalo-thorax,  $\frac{1}{12}$ th, breadth,  $\frac{1}{16}$ th ; breadth of the abdomen,  $\frac{1}{14}$ th ; length of a posterior leg,  $\frac{3}{16}$ ths ; length of a leg of the second pair,  $\frac{1}{8}$ th.

The legs are of a pale, reddish-brown hue, marked with brownish-black annuli ; the fourth pair is the longest, then the third, and the second pair is the shortest ; each tarsus is terminated by two long, curved, slightly pectinated claws. The palpi are short, and of a yellowish-white colour, with the exception of the axillary joint and the base of the humeral joint, which have a dark-brown hue. The cephalo-thorax is nearly quadrilateral ; it slopes abruptly in the posterior region, and is prominent in front, projecting beyond the falces ; its colour is very dark-brown, a longitudinal line of whitish hairs extending above each lateral margin ; the upper part is covered with yellowish-brown and whitish hairs, a short line of the latter occurring in the middle, behind the posterior eyes. The falces are vertical, and armed with a few small teeth on the inner surface ; the maxillæ are greatly enlarged at the extremity ; the lip is somewhat pointed, and the sternum is oval. These parts are of a very dark-brown colour, the extremities of the maxillæ and lip being much the palest. The abdomen is ovi-form, projecting over the base of the cephalo-thorax ; it is of a brown colour, and is clothed with yellowish-brown, reddish-brown, and yellowish-white hairs intermixed ; some whitish hairs occur in front, and a few of the same hue form a spot immediately above the spinners : in the middle of the anterior part there are two small, obscure, yellowish-white, concentric arcs of circles, to which succeeds a series of angular lines of the same colour, whose vertices are directed forwards ; the first two lines of the series are the most extensive, the extremities of the second being reflected and in contact with the first ; the sides are of a brown colour blended with yellowish-white, and a broad, reddish-brown band extends along the middle of the under part ; the superior spinners are of a dark-brown hue, and the other two pairs have a reddish-brown tint ; the colour of the branchial opercula is pale-brown.

The male greatly resembles the female, but it is rather smaller and darker coloured, and

the relative length of its legs is different, the first pair being a little longer than the third. The whole of the first and second pairs of legs, and the thighs of the third and fourth pairs, are of a brownish-black colour. The cubital and radial joints of the palpi are short; the latter, which is the smaller, projects from its extremity, on the outer side, a long, pointed apophysis, curved abruptly at the end; the digital joint is large, oval, of a very dark-brown colour, convex and hairy externally, and concave within, comprising the palpal organs, which are highly developed, prominent, projecting upwards to the articulation of the cubital with the radial joint, not complex in structure, and have a dark-brown hue.

*Salticus distinctus* occurs in Denbighshire, Caernarvonshire, and the north of Lancashire, on stone walls, in the interstices of which the female fabricates a cell of compact, white silk, attached to the surface of the stone. In July she constructs in this cell a lenticular cocoon, measuring one sixth of an inch in diameter, and deposits in it about sixteen spherical eggs, of a pale-yellow colour, not agglutinated together. The young, even before they quit the cocoon, exhibit some of the marks most characteristic of the species.

This spider is regarded by M. Walckenaer as identical with *Attus erraticus* ('Hist. Nat. des Insect. Apt.,' tom. iv., p. 409), from which it differs both in structure and colour. The maxillæ of *Salticus distinctus* are shorter, stronger, much more enlarged at the extremity, and straighter than those of *Attus erraticus*; its lip too, instead of being obtuse like that of the latter, is somewhat pointed, and its falces, sternum, and superior pair of spinners, have a much darker hue; the figures also on the cephalo-thorax and abdomen of both species, designed by the disposition of their respective colours, are dissimilar.

The *Euophrys tigrina* of M. Koch is the same as *Salticus distinctus*; but the *Salticus tigrinus* and the *Salticus litoralis* of M. Hahn ('Die Arachn.,' Band i, p. 62, tab. 16, fig. 47; and p. 70, tab. 18, fig. 53) should be expunged from the synonyma of *Euophrys tigrina*, among which M. Koch has placed them, as they are distinct species, and have not yet been observed in Great Britain.

#### SALTICUS FLORICOLA. Pl. III, fig. 30.

*Euophrys floricola*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 34.

— — Koch, Die Arachn., Band xiv, p. 39, tab. 473, fig. 1301.

Length of the male,  $\frac{1}{9}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{20}$ th; breadth of the abdomen,  $\frac{1}{20}$ th; length of a posterior leg,  $\frac{1}{6}$ th; length of a leg of the second pair,  $\frac{1}{12}$ th.

The cephalo-thorax is large, somewhat quadrilateral, sloping abruptly at the base, depressed before, and projecting a little beyond the falces in front; it is of a brownish-black colour; the sides and front are clothed with white hairs, those below the lateral eyes having a brownish tinge; a short, longitudinal streak, composed of white hairs, occurs in the middle of the posterior region, and the large intermediate eyes of the anterior row are surrounded



with red hairs. The minute intermediate eye of each lateral row is nearly equidistant from the eyes constituting its extremities. The falces are short, conical, and vertical; the maxillæ are straight, and enlarged and rounded at the extremity. These organs are of a yellowish-brown colour. The lip is triangular, and the sternum is oval. These parts have a dark-brown hue, the latter being clothed with white hairs. The legs are robust, provided with hairs and sessile spines, and are of a yellow-brown colour, with dark-brown annuli, the tibiæ and metatarsi of the anterior pair having a brown-black hue; the fourth pair is the longest, then the first, and the second pair is the shortest; each tarsus is terminated by two curved claws, below which there is a small scopula. The palpi resemble the legs in colour, but are without annuli, the digital joint only being tinged with brown; they are densely clothed with white hairs, and the radial joint projects a slender, pointed apophysis from its extremity, on the outer side; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs, which are moderately developed, not very complex in structure, prominent at the base, and of a dark-brown colour. The abdomen is oviform, densely covered with hairs, convex above, and projects over the base of the cephalo-thorax; a short, white streak is directed backwards from its anterior extremity, and a series of curved or slightly angular, brown-red lines extends along the middle of the upper part; on each side of the anterior part of the series there are three white spots disposed longitudinally in pairs, the two posterior ones being the widest apart, and much the largest; the sides and under part are covered with white hairs, a few brown-red ones being mingled with those on the former, and a white spot occurs immediately above the superior spinners, which have a brown-black hue, that of the inferior pair being pale, yellowish-brown.

The Rev. O. P. Cambridge captured this species among the sand-hills at Southport in June, 1859.

#### SALTICUS GRACILIS.

*Salticus gracilis*, Hahn, Die Arachn., Band i, p. 73, tab. 18, fig. 55

— — Blackw., Linn. Trans., vol. xix, p. 122.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 447.

*Attus* — Walck., Hist. Nat. des Insect. Apt., tom. i, p. 423.

*Euophrys* — Koch, Uebers. des Arachn. Syst., erstes Heft, p. 33.

Length of the female,  $\frac{3}{50}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{16}$ th, breadth,  $\frac{1}{50}$ th; breadth of the abdomen,  $\frac{1}{16}$ th; length of a posterior leg,  $\frac{3}{50}$ ths; length of a leg of the second pair,  $\frac{1}{50}$ th.

The cephalo-thorax is nearly quadrilateral; it slopes from the middle towards each extremity, and projects a little beyond the base of the falces; it is glossy, and of a very dark-brown colour, with a transverse, curved band of white and yellowish-brown hairs intermixed passing behind the eyes, the extremities of which extend to a transverse band of similar hairs

situated in front. The falces are small, vertical, and armed with a few teeth on the inner surface; these organs, with the maxillæ and lip, have a dark-brown hue, their extremities being much the palest. The sternum is oval and of a dark-brown colour. The legs are short, and have a yellowish-brown tint, with black annuli, those at the extremities of the thighs and tibiæ being the most conspicuous; the fourth pair is the longest, then the third, and the second pair is the shortest; each tarsus is terminated by two curved, pectinated claws. The palpi are short, strong, and have a pale, yellowish-brown hue. The abdomen is oviform, thickly covered with hairs, pointed at its posterior extremity, and projects over the base of the cephalo-thorax; it is of a very dark-brown colour above, with scattered, yellowish-brown hairs; at the anterior part there is a semicircular band, of a yellowish-white hue, and on the sides there are several oblique spots of the same colour; in the middle two angular, yellowish-white lines occur, whose vertices are directed forwards, the posterior one being much the larger; the under part has a yellowish-white colour, with a broad, longitudinal, dark-brown band in the middle; and the hue of the branchial opercula is yellowish-brown.

Specimens of *Salticus gracilis* have been taken among heath growing in woods on the Caernarvonshire and Denbighshire sides of the valley of the Conway.

Though M. Hahn has described the female only of this species, yet the figure he has given is that of an immature male.

#### SALTICUS CUPREUS. Pl. III, fig. 31.

*Salticus cupreus*, Hahn, Die Arachn., Band ii, p. 42, tab. 55, fig. 128.

— — Blackw., Linn. Trans., vol. xix, p. 121.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 447.

— *æneus*, Hahn, Die Arachn., Band i, p. 65, tab. 17, fig. 49.

— *flavipes*, Hahn, Die Arachn., Band i, p. 66, tab. 17, fig. 50.

*Attus cupreus*, Walek., Hist. Nat. des Insect. Apt., tom. i, p. 409.

— *atrovirens*, Sund., Vet. Acad. Handl., 1832, p. 210.

*Heliophanus cupreus*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 30.

— — Koch, Die Arachn., Band xiv, p. 56, tab. 476, figs. 1313—1315.

— *flavipes*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 30.

— — Koch, Die Arachn., Band xiv, p. 64, tab. 477, figs. 1320—1322.

— *dubius*, Koch, Die Arachn., Band xiv, p. 61, tab. 476, figs. 1317, 1318.

Length of the female,  $\frac{1}{5}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{15}$ th; breadth of the abdomen,  $\frac{1}{15}$ th; length of a posterior leg,  $\frac{1}{5}$ th; length of a leg of the second pair,  $\frac{1}{7}$ th.

The cephalo-thorax is somewhat quadrilateral, and projects in front a little beyond the base of the falces; it is of a very dark-brown colour, tinged with copper-green; a transverse line immediately behind the eyes, two oblique ones in the posterior region, whose anterior

extremities nearly meet, and an obscure one on each lateral margin being whitish. The falces are vertical, and, with the maxillæ, lip, and sternum, are of a very dark-brown hue. The legs are of a yellow colour, marked with longitudinal black streaks, particularly on the anterior side; the fourth pair is the longest, then the third, and the second pair is the shortest; each tarsus is terminated by two curved, pectinated claws. The hue of the palpi is pale-yellow. The abdomen is oviform, pointed at its posterior extremity, and projects over the base of the cephalo-thorax; above it is of a dark-green colour, with a curved, white line in front, which extends along the sides more than half of its length, and two irregular, parallel spots of the same hue on each side of the medial line; the under part has a brownish-black colour, and is thinly covered with whitish hairs. The white marks on the cephalo-thorax and abdomen, and the black streaks on the legs, are not constant, but are liable to vary in different individuals.

The male bears a strong resemblance to the female, but it is smaller and darker coloured; the relative length of its legs also is different, the first pair being longer than the third; and the maxillæ have a strong, bifid protuberance on the outer side, near the extremity. The palpi have a brownish-black colour, with some white hairs in front, which form a longitudinal line; the humeral joint is strong, and has a very large bifid protuberance on the under side, one division of which is longer and more pointed than the other; the cubital and radial joints are short; the former is much the larger, and the latter projects two long, pointed apophyses from its extremity, one on the outer side, and the other, which is curved, on the under side; the digital joint is of an oblong-oval form, convex, and hairy externally, concave within, comprising the palpal organs; they are highly developed, prominent at the base, particularly on the inner side, not complicated in structure, with a curved, pointed, corneous spine at the extremity, and are of a brownish-black colour.

There are several varieties of this spider, some of which have been described by arachnologists as distinct species. Crevices among accumulated fragments of rock, occurring in woods in the mountainous parts of Denbighshire and Caernarvonshire, are frequently selected for its abode, and afford it great facilities of escaping from danger. In June the female encloses herself in a cell of white silk, of a compact texture, on the exterior surface of which particles of soil, withered moss, and other materials are sometimes sparingly distributed; she usually attaches it to the under side of stones or dead leaves, depositing in it from twenty to thirty spherical eggs, of a pale-yellow colour, connected by fine, silken lines.

#### SALTICUS NOTATUS.

*Salticus notatus*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. x, p. 94.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xi, p. 114.

Length of the female,  $\frac{1}{4}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{1}{10}$ th; length of a posterior leg,  $\frac{1}{6}$ th; length of a leg of the second pair,  $\frac{1}{8}$ th.

The cephalo-thorax is nearly quadrilateral, and is sparingly clothed with black and whitish hairs; it slopes abruptly in the posterior region, and is prominent in front, projecting beyond the base of the falces, which are small, vertical, and armed with a few teeth on the inner surface; the sternum is oval. These parts, with the maxillæ and lip, are of a brown-black colour, the last two, which are the palest, having a reddish tinge, particularly at their extremities. The legs are robust, provided with hairs and sessile spines, and are of a pale-yellow colour, the coxæ of the posterior pair having a black spot on the upper side; the fourth pair is the longest, the first and third pairs are equal in length, and the second pair is the shortest; each tarsus is terminated by two curved claws. The palpi resemble the legs in colour. The abdomen is oviform, pointed at its posterior extremity, convex above, projecting over the base of the cephalo-thorax; it is of a brown-black colour, and has short, whitish hairs thinly distributed over its surface; a pale, yellowish-brown band, broader in the posterior than in the anterior region, extends along the middle of the upper part, and an obscure, narrow band of whitish hairs is curved round the anterior part, and produced on the sides nearly to the spinners; the sexual organs have a reddish-brown hue.

An adult female of this species was found among herbage in a wood at Southgate, in June, 1850, and is in Mr. Walker's cabinet.

SALTICUS PROMPTUS. Pl. III, fig. 32.

*Salticus promptus*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. xiii, p. 173.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xiv, p. 28.

Length of an immature female,  $\frac{3}{20}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{24}$ th; breadth of the abdomen,  $\frac{1}{20}$ th; length of a posterior leg,  $\frac{1}{10}$ th; length of a leg of the second pair,  $\frac{1}{12}$ th.

The cephalo-thorax is large, glossy, nearly quadrilateral, abruptly sloped behind, depressed and prominent before, projecting beyond the base of the falces; it is of a fulvous colour, with the entire space between the eyes, a line extending along the middle of its posterior half, several oblique ones on the sides of that part, and the margins, of a black hue; the cephalic region is slightly tinged with brown, and the anterior eyes are encircled with white hairs. The falces are small, conical, vertical, and have a few minute teeth on their inner surface; the maxillæ, which are straight, are enlarged and rounded at the extremity; the lip is moderately long, and rounded at the apex; and the sternum has a regular oval form. The colour of these parts is pale, yellowish-brown, the sternum having a broad, black border. The legs are robust, particularly those of the anterior pair, and are provided with hairs and sessile spines, two parallel rows of the latter occurring on the inferior surface of the tibiæ and metatarsi of the anterior legs; the fourth pair is the longest, the first pair rather surpasses the third, and the second pair is the shortest; their



colour is pale, yellowish-brown, and there is an irregular black spot on the upper part of the coxæ of the posterior pair, and a curved one at the extremity of the femora of the anterior pair, on the under side; each tarsus is terminated by two curved, slightly pectinated claws, below which there is a small scopula. The palpi resemble the legs in colour, and have a few black spots on the cubital, radial, and digital joints, in front. The abdomen is oviform, convex above, projecting a little over the base of the cephalo-thorax; it is clothed with black and short, hoary hairs, and is of a fulvous colour, with curved, transverse, oblique rows of black spots, more or less confluent, extending from the upper part to the sides; and on the under part numerous black spots are distributed without regularity; the branchial opercula have a pale-yellowish tint; and there is a longitudinal, black streak on the upper part of each superior spinner.

In October, 1853, an immature female of this species, which is nearly allied to *Salticus frontalis* and *Salticus reticulatus*, was received from the Rev. Hamlet Clark, who took it near Northampton in September in the same year.

SALTICUS RETICULATUS. Pl. III, fig. 33.

*Salticus reticulatus*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. xi, p. 14.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xi, p. 114.

Length of the female,  $\frac{1}{10}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{18}$ th, breadth,  $\frac{1}{24}$ th; breadth of the abdomen,  $\frac{1}{24}$ th; length of a posterior leg,  $\frac{1}{5}$ th; length of a leg of the second pair,  $\frac{1}{16}$ th.

The legs are robust, provided with hairs, and with two parallel rows of large, sessile spines on the inferior surface of the tibiæ and metatarsi of the first and second pairs; they are of a pale, yellowish-brown hue, with obscure, dark annuli at the joints; the fourth pair is the longest, then the first, which a little surpasses the third pair, and the second pair is the shortest; each tarsus is terminated by two curved claws, below which there is a small scopula. The palpi resemble the legs in colour. The cephalo-thorax is large, nearly quadrilateral, thinly clothed with hairs, somewhat glossy, depressed before, abruptly sloped behind, and projects beyond the base of the falces, which are small, conical, and rather inclined towards the sternum; the maxillæ are short, straight, and enlarged and rounded at the extremity; the lip is triangular; and the sternum is oblong-heart-shaped. These parts are of a yellowish-brown colour; the sternum is the palest, and the lateral margins of the cephalo-thorax and the region of the eyes have a brownish-black tint. The abdomen is oviform, hairy, moderately convex above, projecting over the base of the cephalo-thorax; it is of a pale, yellow-brown colour, reticulated and streaked with brownish-black lines, a series of pale, yellow-brown and brownish-black angular lines, disposed alternately, and having their vertices directed forwards, extending along the middle of the upper part; the under part is

the least distinctly marked, and the hue of the branchial opercula is yellowish-white; the sexual organs have a longitudinal septum in the middle, and their colour is red-brown.

The male is smaller and rather darker coloured than the female. The cubital and radial joints of its palpi are short; the latter projects a small apophysis from its extremity, on the outer side, and is fringed with long hairs on the inner side; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, remarkably prominent, the base extending to the articulation of the radial with the cubital joint, not very complicated in structure, and are of a dark-brown colour, slightly tinged with red.

Specimens of this minute *Salticus* were found among moss growing in woods on the slopes of Gallt y Rhyg, a mountain near Oakland. Both sexes are adult in summer.

#### SALTICUS JENYNSII.

*Salticus Jenynsii*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. xiii, p. 174.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xiv, p. 29.

Length of the female,  $\frac{3}{10}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{12}$ th; breadth of the abdomen,  $\frac{1}{10}$ th; length of an anterior leg,  $\frac{1}{4}$ th; length of a leg of the third pair,  $\frac{3}{10}$ ths.

The legs are robust, especially those of the first and second pairs, and are provided with hairs and strong, black, sessile spines; their colour is yellowish-brown, a longitudinal, black line extending along the upper part of the femora, genua, and tibiæ; the anterior and posterior pairs are the longest and of equal length, and the third pair is the shortest; each tarsus is terminated by two curved claws, below which there is a scopula. The palpi have a yellowish-brown hue, the digital joint being the darkest. The cephalo-thorax is nearly quadrilateral, prominent in front, projecting beyond the base of the falces; it is covered with yellowish-brown and black hairs intermixed, and has some long, yellowish ones below the anterior row of eyes; a narrow, black line occurs on the margins, immediately above which there is a longitudinal one of a yellowish-brown hue. The falces are short, powerful, conical, and vertical; the maxillæ are straight, and enlarged and rounded at the extremity; and the lip is somewhat oval. These parts have a yellowish-brown tint, with the exception of the bases of the maxillæ and lip, which have a dark-brown hue. The sternum is small, oval, and of a brown colour, the margins being much the darkest. The abdomen is oviform, pointed at the spinners, convex above, projecting over the base of the cephalo-thorax; it is densely clothed with short, yellowish-brown hairs, interspersed with long, black ones; a faint, red-brown line passes from the spinners along the middle of the upper part, more than half of its length, and then separates into two diverging branches, which extend to its anterior extremity and form a very acute angle; these red-brown lines have an obscure, narrow, whitish border, bounded

by a faint, red-brown, parallel line, and an obscure, whitish line bisects the angular space comprised between the diverging branches of the medial line; on the under part there is an obscure, dark band, which tapers gradually from the sexual organs to the spinners; and the branchial opercula have a pale-yellow hue.

This addition to our indigenous *Saltici* has been made through the liberality of the Rev. Leonard Jenyns, M.A., F.L.S., from whom it was received in February, 1853, together with numerous specimens of spiders which had been captured in Cambridgeshire.

SALTICUS BLACKWALLII. Pl. III, fig. 34.

*Salticus Blackwalli*, Clark, Annals and Mag. of Nat. Hist., second series, vol. xvi, p. 329.

— . — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xx, p. 498.

Length of the female,  $\frac{1}{3}$ d of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{12}$ th; breadth of the abdomen,  $\frac{1}{10}$ th; length of a posterior leg,  $\frac{11}{24}$ ths; length of a leg of the second pair,  $\frac{1}{5}$ th.

The cephalo-thorax is large, glossy, slightly pubescent, nearly quadrilateral, abruptly sloped behind and prominent before, projecting beyond the base of the falces; it is of a fulvous colour, with the entire space between the eyes, a line extending along the middle of its posterior half, numerous spots and several oblique lines in that region converging towards the centre, and the lateral and posterior margins of a black hue; the frontal margin is densely covered with longish, pale-yellow hairs. The falces are small, subconical, vertical, and armed with a few teeth on their inner surface; the maxillæ are short, straight, and enlarged, and rounded at the extremity; the lip and sternum are oval, the latter being narrower at its anterior than at its posterior extremity. These parts are of a yellowish-brown colour, a short streak on the outer side of the falces, a spot on the inner surface of the maxillæ, the base and outer side of the lip, and the margin of the sternum, being black. The legs are robust, particularly those of the anterior pair, and are provided with hairs and sessile spines, two parallel rows of the latter occurring on the inferior surface of the tibiæ and metatarsi of the first and second pairs; the fourth pair is the longest, the first pair rather surpasses the third, and the second pair is the shortest; their colour is yellowish-brown, with black spots on the upper part of the femora and tibiæ, disposed in a longitudinal row; the anterior legs are marked with black spots on the sides, and those on the superior surface of their femora are confluent; each tarsus is terminated by two curved claws, and below them there is a small scopula. The palpi, which resemble the legs in colour, have a single, minute black spot on the inner surface of the cubital joint. The abdomen is of an oblong-oviform figure, convex above, projecting a little over the base of the cephalo-thorax; it is thinly clothed with hairs, and of a yellowish-brown colour; on each side of the medial line of the upper part there is a longitudinal band, composed of large, confluent, black spots; these bands converge to their

extremities, where they meet ; the sides are marked with numerous short, blackish streaks and spots, disposed in rows ; on the under part fewer and more minute spots of the same hue are distributed, those in the medial line being the largest ; the branchial opercula, which are of a pale-yellow colour, have a curved, black line above their outer margin ; a streak of the same hue extends along the upper surface of each superior spinner ; and the colour of the sexual organs is black, faintly tinged with red.

This fine species was discovered by the Rev. Hamlet Clark, in September, 1855, on a gate near the seashore, at Southport, Lancashire.

SALTICUS TARDIGRADUS. Pl. III, fig. 35.

*Salticus tardigradus*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 447.

— *Rumphii*, Latr., Gen. Crust. et Insect., tom. i, p. 124.

— *Rumpfi*, Hahn, Die Arachn., Band i, p. 56, tab. 15, fig. 42.

*Attus tardigradus*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 461.

*Dendryphantes muscosus*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 31.

*Marpissa muscosa*, Koch, Die Arachn., Band xiii, p. 63, tab. 443, figs. 1129, 1130.

Length of the female,  $\frac{11}{34}$ ths of an inch ; length of the cephalo-thorax,  $\frac{3}{20}$ ths, breadth,  $\frac{1}{8}$ th ; breadth of the abdomen,  $\frac{1}{8}$ th ; length of a posterior leg,  $\frac{5}{16}$ ths ; length of a leg of the second pair,  $\frac{11}{48}$ ths.

The abdomen is of an elongated, oviform figure, being twice the length of the cephalo-thorax, over the base of which it projects a little ; it is thickly covered with yellowish-white, red-brown, and black hairs, mingled together, the last being the longest ; along the middle of the upper part there extends a broad, dentated, grayish band, bordered with black, from the lateral angles of which are produced oblique, grayish lines, accompanied by obscure, brownish-black lines contiguous to their anterior side ; the sides have a dark-brown colour, approaching to black at the upper part, and the under part, which has a dull-gray hue, is minutely spotted with black ; the branchial opercula are of a dull-yellow colour. The cephalo-thorax is large, depressed, and somewhat quadrilateral ; it is of a dark-brown colour, and is densely clothed with yellowish-white, red-brown, and black hairs ; the margins have a brownish-black hue, and the narrow space between the anterior eyes and the falces is amply supplied with long, buff hairs. The falces are short, strong, vertical, armed with a few teeth on the inner surface, and of a dark-brown colour. The sternum is oval, being narrowest at the anterior extremity ; it has numerous long, whitish hairs at the posterior part, and, with the lip and maxillæ, is of a dark-brown colour, the last, which are the palest, having their extremity and inner margin tinged with red. The legs are short and robust, the thighs of the anterior pair being dilated ; they are provided with hairs and strong spines, and are marked with brownish-black and reddish-brown streaks, spots, and annuli, the femora and tibiæ of the anterior pair excepted, which have a brown-black hue, and are thinly covered with



yellowish-white hairs; the fourth pair is the longest, then the first, and the second pair is the shortest; each tarsus has two curved, slightly pectinated claws at its extremity. The palpi are short, and resemble the legs in colour.

The male bears a general resemblance to the female, and the relative length of its legs is the same; but it is smaller, darker coloured, and the grayish band extending along the middle of the upper part of the abdomen is much less distinctly marked, and sometimes comprises black, angular lines, whose vertices are directed forwards. The maxillæ have a short, pointed process at the extremity, on the outer side. The palpi are short, strong, and of a very dark-brown colour; the humeral joint has an obtuse protuberance near its extremity, on the inner side, and the radial joint has a strong, curved, pointed apophysis at its extremity, on the outer side; the digital joint is broad, oval, convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, complicated in structure, and very prominent, projecting at the base in a convexity extending upwards to the articulation of the cubital with the radial joint; they are somewhat pointed at the extremity, have two prominent, corneous, black processes at the base, towards the outer side, and are coloured with different shades of brown.

In the summer of 1845, Miss Ellen Clayton, of Lancaster, captured specimens of *Salticus tardigradus* at Balham, in Surrey. A female, which was placed in a phial, spun a sac of fine, white silk in June, and attached to its inner surface a lenticular cocoon of delicate, white silk, of a loose texture, measuring one third of an inch in diameter, in which she deposited thirty-five spherical eggs, of a pale-yellow colour, not agglutinated together.

M. Koch's figure, number 1130, is stated to represent a female in the text, but a male is delineated in the plate.

#### SALTICUS FORMICARIUS. Pl. III, fig. 36.

*Salticus formicarius*, Latr., Gen. Crust. et Insect., tom. i, p. 124.

— Sund., Vet. Acad. Handl., 1832, p. 200.

— Koch, Die Arachn., Band xiii, p. 33, tab. 438, figs. 1101, 1102.

— Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 448.

*Attus* — Walck., Hist. Nat. des Insect. Apt., tom. i, p. 470.

Length of the female,  $\frac{1}{4}$ th of an inch.

The cephalo-thorax is long, and slopes abruptly in the posterior region; it is of a brownish-red colour, the anterior and most elevated part being black. The falces, maxillæ, lip, and sternum, are of a dark, reddish-brown hue. The legs have a reddish-brown colour, the thighs of the anterior pair being much the darkest, and are marked with longitudinal black lines; the fourth pair is the longest. The palpi, which are of a reddish-brown hue, have the digital joint somewhat dilated. The abdomen is of an oblong-oviform figure, and is divided into two nearly equal parts by an irregular, transverse, white line, whose continuity

is sometimes interrupted in the middle; the anterior part, or that before the transverse white line, is of a brownish-red colour, and the posterior part is black.

The male closely resembles the female, but it is smaller, rather darker coloured, and its falces, which are longer and plain on the upper part, are directed forwards. The digital joint of the palpi is of an oblong-oval form, convex and hairy externally, concave within, comprising the palpal organs, which are moderately developed.

Dr. Leach has remarked, in the supplement to the fourth, fifth, and sixth editions of the 'Encyclopædia Britannica,' article "Annulosa," that *Attus (Salticus) formicarius* is found, though rarely, in Scotland, and on his testimony its claim to a place among British spiders is founded.

*Family* THOMISIDÆ.

Countries differing widely in geographical position and temperature are inhabited by the spiders included in this comprehensive family, which vary greatly in size, and have the falces articulated vertically or on an inclined plane. By the form and arrangement of the legs, which present much diversity in their relative proportions, numerous species are enabled to move forwards, backwards, or in a lateral direction with facility; the tarsi are usually terminated by two claws, and in various instances are supplied with hair-like papillæ, distributed upon their inferior surface, or forming a small scopula at their extremity. The abdomen is provided with three pairs of spinners, and two branchial opercula are situated near its anterior part, on the under side.

In watching for their prey, which they seize by surprise or pursue with agility, the *Thomisidæ* conceal themselves among herbage and leaves, in flowers, in crevices in the bark of trees, of rocks, of walls, in crannies of the earth, and under stones. Many species are very tardy in their motions, but others run with extraordinary celerity.

*Genus* THOMISUS (*Walckenaer*).

*Eyes* disposed on the anterior part of the cephalo-thorax in two transverse rows, forming either a crescent or a segment of a circle whose convex side is in front; they do not differ greatly in size.

*Maxillæ* inclined towards the lip and pointed at the extremity.

*Lip* either triangular or oval, but obtuse at the apex.

*Legs* so articulated as to be extended laterally; the first and second pairs are longer and more robust than the third and fourth pairs.

## THOMISUS BREVIPES. Pl. IV, fig. 37.

*Thomisus brevipes*, Hahn, Die Arachn., Band i, p. 30, tab. 8, fig. 25.

— — Walck., Hist. Nat. des Insect. Apt., tom. i, p. 503.

— — Blackw., Linn. Trans., vol. xix, p. 122.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 448.

*Xysticus* — Koch, Uebers. des Arachn. Syst., erstes Heft, p. 25.

Length of the female,  $\frac{1}{8}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{12}$ th, breadth,  $\frac{1}{12}$ th; breadth of the abdomen,  $\frac{1}{5}$ th; length of a leg of the second pair,  $\frac{5}{24}$ ths; length of a leg of the third pair,  $\frac{1}{7}$ th.

The cephalo-thorax is compressed before, rounded on the sides, truncated in front, abruptly sloped behind, and thinly covered with short, strong hairs; a large, yellowish-brown band, minutely spotted with reddish-brown, which increases in breadth as it approaches the eyes, occupies the medial line; the sides are of a brownish-black colour, mottled with yellowish-brown, and a fine line of the latter hue occurs on the lateral margins. The falces are short, strong, cuneiform, and slightly inclined towards the sternum, which is heart-shaped. These parts are of a yellowish-brown colour, mottled with brownish-black. The maxillæ and lip have a brown hue, their bases being the darkest; the former are convex at the base, and the figure of the latter is oval. The legs are short, and of a yellowish-brown colour, mottled with brownish-black; the first and second pairs are longer and more robust than the third and fourth pairs, the second pair being the longest, and the third pair the shortest; they are provided with strong hairs and sessile spines; two longitudinal rows of the latter occur on the under side of the tibiæ and metatarsi of the first and second pairs, and the tarsi are terminated by two curved, pectinated claws. The palpi resemble the legs in colour, and have a curved claw at their extremity. The eyes describe a crescent on the anterior part of the cephalo-thorax; those of each lateral pair are larger than the intermediate ones; the anterior one is the larger of the two, and the posterior one is seated on a small tubercle. The abdomen is large, depressed, corrugated, particularly on the sides, thinly covered with short, strong hairs, much broader at the posterior than at the anterior extremity, and projects over the base of the cephalo-thorax; it is of a yellowish-brown colour, minutely spotted with red-brown, and has some transverse streaks of a brownish-black hue in the posterior region of the upper part, whose continuity is frequently interrupted in the middle; the sides are irregularly streaked and spotted with brownish-black, and on the under part there are three imperfectly defined, longitudinal bands of a dark, reddish-brown tint; the sexual organs and the branchial opercula have a red-brown hue.

Adult females of this species are occasionally met with under stones in fields adjacent to woods at Oakland, near Llanrwst. The male has not yet been discovered with the palpal organs in a state of development; it closely resembles the female in colour when the digital



joints of its palpi are so tumid as to indicate that it has only to undergo its final change of integument before it arrives at maturity.

As there does not appear to be the least necessity for adopting the genus *Xysticus*, proposed by M. Koch, to which he has transferred this and some other species of British *Thomisi*, the generally received method of arrangement has been adhered to in this instance.

THOMISUS CRISTATUS. Pl. IV, fig. 38.

*Thomisus cristatus*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 521.

— — Latr., Gen. Crust. et Insect., tom. i, p. 111.

— — Sund., Vet. Acad. Handl., 1832, p. 217.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 448.

— *pini*, Hahn, Die Arachn., Band i, p. 26, tab. 8, fig. 23.

— *viaticus*, Hahn, Die Arachn., Band i, p. 35, tab. 10, fig. 29.

— *ulmi*, Hahn, Die Arachn., Band i, p. 38, tab. 10, fig. 30.

— *lateralis*, Hahn, Die Arachn., Band i, p. 40, tab. 10, fig. 31.

*Xysticus mordax*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 25.

— *viaticus*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 25.

— — Koch, Die Arachn., Band xii, p. 70, tab. 412, figs. 1003, 1004.

— *ulmi*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 25.

Length of the female,  $\frac{1}{4}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{16}$ th, breadth,  $\frac{1}{11}$ th; breadth of the abdomen,  $\frac{3}{10}$ ths; length of an anterior leg,  $\frac{5}{16}$ ths; length of a leg of the third pair,  $\frac{1}{5}$ th.

The legs are robust, and are furnished with hairs and spines; the first and second pairs, which are decidedly the longest, and equal in length, have the tibiæ and metatarsi supplied with two longitudinal rows of strong spines on the under side, and the third pair is the shortest; they are of a dull, reddish-brown colour, streaked with yellowish-white, and spotted with brownish-black; each tarsus is terminated by two curved, pectinated claws. The palpi are short, of a dull, reddish-brown colour, with strong spines on the cubital, radial, and digital joints, and a curved, pectinated claw at their extremity. The cephalo-thorax is large, rounded on the sides, slightly compressed before, broadly truncated in front, sloped towards the anterior part, and more abruptly so towards the base; it is provided with a few, scattered, strong, black hairs, particularly on the anterior part, and is of a dull, reddish-brown colour, mottled with yellowish-white; the margins, a transverse line situated between the two rows of eyes, and a large bifid mark in the middle, whose divarications extend to the posterior eyes, are of the latter colour. The falces are short, strong, vertical, and have a reddish-brown hue. The maxillæ are convex near the base, and the lip is triangular, but rounded at the apex. These parts, with the sternum, which is heart-shaped, are of a reddish-brown colour, obscurely mottled with yellowish-brown,

the maxillæ and lip being much the darkest. The eyes are disposed on the anterior part of the cephalo-thorax in the form of a crescent; the lateral eyes, which are seated on tubercles, are larger than the intermediate ones, those of the anterior row being the largest of the eight. The abdomen is depressed, corrugated, particularly on the sides, and has black hairs sparingly distributed over its surface; it is broader at the posterior than at the anterior extremity, the latter, which appears as if cut in a straight line across, projecting over the base of the cephalo-thorax; the upper part is of a dark-brown colour, and is marked with five circular depressions; the three anterior ones are disposed in a triangle, whose vertex is directed forwards, and the other two are situated parallel to its base; a large, strongly dentated, yellowish-brown band extends along the middle, and the sides and under part have a yellowish-brown hue, the former being shaded with darker brown; the branchial opercula are of a dark-brown colour, bordered with yellow on the inner margin; and the sexual organs have a longitudinal, red-brown septum in the middle.

The figures designed on the cephalo-thorax and on the upper part of the abdomen are nearly alike in both sexes, and the relative length of their legs is the same, but the male is much smaller and darker coloured than the female. Its abdomen is of a very dark-brown hue above, inclining to black, and is surrounded by a band of pale, yellowish-white; the broad, dentated band extending along the middle is of a yellow-brown colour, mottled with dark-brown; the sides and under part are of a dark-brown hue, and the branchial opercula have a reddish-brown tint. The colour of the tarsi, metatarsi, and the greater part of the tibiæ of the first and second pairs of legs, is pale, yellowish-brown; the other parts of those limbs have a brown-black hue, and the anterior side of the femora of the first pair of legs is supplied with strong, black spines; the prevailing hue of the third and fourth pairs of legs is pale, yellowish-brown, but the tibiæ are marked with dark-brown, and the femora are of a dark-brown colour, obscurely marked with yellowish-brown. The palpi are short, and of a brown hue, tinged with red, the cubital, radial, and digital joints being much the palest; the radial joint projects two strong apophyses from its extremity, one on the outer side, and the other, which is larger, more prominent and obtuse, on the under side; the digital joint is oval, with a slender, prominent process on the outer side, against the base of which the extremity of the smaller apophysis projected by the radial joint applies; it is convex and hairy externally, concave within, comprising the palpal organs; these organs are highly developed, complicated in structure, with a strong, black spine curved round their extremity, and terminating in a point in the slender process on the outer side of the digital joint; near their middle there is a black, curved, prominent spine, which has a conical point on its convexity, and a curved, pointed, projecting process is situated at their superior part, on the inner side, at the base of which there is a very acute, erect point; their colour is dark-brown, faintly tinged with red.

The varieties of *Thomisus cristatus*, caused by differences in age, condition, and other circumstances, are very numerous, and many of them have been mistaken for distinct species. This common spider occurs on the ground and among the herbage of old pastures; in form and gait it bears some similitude to a small crab, moving in a lateral direction almost with as great facility as it does forwards; it is remarkable also for its propensity to take aerial excursions, particularly when immature. In July the female constructs a lenticular cocoon, of white silk, of a compact texture, measuring about one third of an inch in diameter, which is

frequently attached to the inferior surface of a stone or fragment of rock ; it contains between eighty and ninety spherical eggs, of a pale, yellowish-white colour, not agglutinated together.

This spider is found in Scotland and Ireland.

A young female of this species, captured in July, 1835, had the two lateral pairs of eyes only ; the four small intermediate eyes were altogether wanting, not the slightest rudiment of them being perceptible even with the aid of a powerful magnifier.

THOMISUS AUDAX. Pl. IV, fig. 39.

*Thomisus audax*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. xiv, p. 29.

*Xysticus* — Koch, Uebers. des Arachn. Syst., erstes Heft, p. 25.

— — Koch, Die Arachn., Band xii, p. 74, tab. 413, figs. 1005—1008.

Length of the female,  $\frac{1}{4}$ th of an inch ; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{10}$ th ; breadth of the abdomen,  $\frac{2}{50}$ ths ; length of an anterior leg,  $\frac{2}{10}$ ths ; length of a leg of the third pair,  $\frac{2}{10}$ ths.

The eyes are disposed on the anterior part of the cephalo-thorax, in two transverse, curved rows, forming a crescent whose convexity is directed forwards ; the eyes of each lateral pair, which are seated on a tubercle, are larger than the intermediate ones, those of the anterior row being the largest of the eight. The cephalo-thorax is convex, compressed before, rounded on the sides, truncated in front, and depressed behind ; the colour of the sides is brownish-black, marbled with yellowish-white, a conspicuous spot of the latter hue occurring near the posterior extremity of each ; the narrow, lateral margins, and a broad band extending along the middle, have a yellowish-white tint, the latter being contracted near its base. The falces are short, strong, subconical, and vertical ; the maxillæ are powerful, convex near the base, and inclined towards the lip, which is somewhat oval ; and the sternum is heart-shaped. These parts are of a pale, yellowish-brown colour, spotted with darker brown, and the base of the falces and lip has a brown hue, that of the latter being the darker. The legs are provided with hairs and some strong spines, two parallel rows of the latter occurring on the inferior surface of the tibiæ and metatarsi of the first and second pairs, which are much longer and more robust than the third and fourth pairs ; the first pair is rather longer than the second, and the third pair is rather shorter than the fourth ; each tarsus is terminated by two curved, pectinated claws, and the palpi, which are short, have a small, curved, pectinated claw at their extremity. These limbs are of a yellowish-brown colour, spotted with dark-brown, the extremity of the femora, genua, tibiæ, and metatarsi, and the base of the tibiæ of the third and fourth pairs of legs, having a brownish-black tint on the upper surface. The abdomen is thinly clothed with hairs, moderately convex above, broader at the posterior than at the anterior extremity, which appears as if cut in a straight line across, and projects over the base of the cephalo-thorax ; it is of a pale, yellowish-brown colour, tinged with olive and spotted with black, the spots on the sides forming oblique rows, and those on the under part being

fewer and more minute; the anterior part of the sides has a reddish tint, and a broad, dentated, pale, yellowish-brown band, tinged with olive and bordered with black, extends along the middle of the upper part; the spinners have a brown hue, and that of the sexual organs, which have a strong, longitudinal septum in the middle, is red-brown. This spider varies greatly in colour, some individuals being much darker and more distinctly marked than others.

M. Koch remarks that the male is smaller and darker coloured than the female. The coxæ, femora, genua, and base of the tibiæ of the first and second pairs of legs, have a brown-black hue, that of the other parts of these limbs being yellowish-white. The colour of the palpi is brown, with the exception of the digital joint, which has a gray-brown tint, and that of the palpal organs is black.

Specimens of *Thomisus audax*, supplied by the Rev. Hamlet Clark, were met with near Northampton and at Holme Fen, Huntingdonshire, in the autumn of 1853. They were all females.

M. Walckenaer, regarding the *Xysticus (Thomisus) audax* of M. Koch as a mere variety of *Thomisus cristatus*, has included it among the synonyma of that species ('Hist. Nat. des Insect. Apt.,' tom. i, p. 521), from which, however, it is undoubtedly distinct.

#### THOMISUS ERRATICUS. Pl. IV, fig. 40.

*Thomisus erraticus*, Blackw., Research. in Zool., p. 408.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 449.

Length of the female,  $\frac{3}{10}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{12}$ th, breadth,  $\frac{1}{13}$ th; breadth of the abdomen,  $\frac{1}{9}$ th; length of a leg of the second pair,  $\frac{11}{32}$ ths; length of a leg of the third pair,  $\frac{1}{6}$ th.

The cephalo-thorax is large, glossy, compressed before, rounded on the sides, broadly truncated in front, and depressed in the anterior region; it is of a pale, reddish-brown colour, with a black streak extending from each lateral pair of eyes toward the abdomen; between these streaks there is a yellowish-white band, which is bifid before; a fine line of the same hue occurs on the lateral margins, and immediately above it, in the posterior region, there is an obscure, parallel, blackish band; on the frontal margin there are some strong, black bristles, directed forwards. The eyes are disposed on the anterior part of the cephalo-thorax in the form of a crescent; the lateral eyes, which are seated on yellowish-white tubercles, are larger than the intermediate ones, those of the anterior row being the largest of the eight. The falces are small, cuneiform, and vertical; the maxillæ are enlarged at the base, where the palpi are inserted; the figure of the lip is triangular; the sternum is of an elongated heart-shape; and the legs and palpi are robust, and are furnished with hairs and strong spines. These parts are of a pale, reddish-brown colour, the lip being the darkest, particularly in the medial line. The first and second pairs of legs, which are much longer and more powerful



than the third and fourth pairs, are nearly equal in length, the second pair being rather the longer, and the fourth pair a little surpasses the third in longitudinal extent; each tarsus is terminated by two curved claws, pectinated at the base. The abdomen is depressed, thinly covered with hairs, much broader at the posterior than at the anterior extremity, and projects over the base of the cephalo-thorax; it is of a pale, yellowish-brown hue above, with a broad, irregular, dark-brown band extending on each side of the medial line nearly to the spinners, immediately above which organs there are a few transverse streaks of the latter colour connecting the lateral bands; in the space comprised between these bands there are a short, dark-brown streak, directed backwards from the anterior part of the abdomen, and five indented spots of the same hue, forming an angle whose vertex is directed forwards; a whitish band extends along the sides, and below it there is a parallel, dark-brown band; underneath, the abdomen is of a yellowish-brown colour, mottled with dark-brown about the middle; and the branchial opercula have a yellowish-white tint.

The male is smaller and darker coloured than the female. The femoral and genual joints of its first and second pairs of legs are of a dark, reddish-brown colour, inclining to black above, the other parts of these limbs, and the whole of the third and fourth pairs, being either of a pale-red or yellowish-brown colour. The humeral joint of the palpi is of a dark, reddish-brown hue; the cubital and radial joints are short, and their colour is pale, red-brown; the latter projects a pointed apophysis from its extremity, on the outer side, and another underneath, which has a small protuberance near its termination; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs; they are highly developed, complex in structure, with one or two strong, prominent processes near the upper part, and are of a dark, red-brown colour.

This spider may be seen in summer running on foot-paths in North Wales and Lancashire, but it is not a common species. In June the female constructs a lenticular cocoon, of compact, white silk, measuring one fourth of an inch in diameter; it is commonly attached to the under side of withered leaves, and contains about forty-three spherical eggs, of a pale-yellow colour, not agglutinated together.

THOMISUS SABULOSUS. Pl. IV, fig. 41.

*Thomisus sabulosus*, Hahn, Die Arachn., Band i, p. 28, tab. 8, fig. 24.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xx, p. 498.

*Xysticus* — Koch, Die Arachn, Band xii, p. 64, tab. 411, figs. 999, 1000.

Length of the female,  $2\frac{1}{2}$  lines (Koch).

The legs are provided with hairs and spines, and the first and second pairs, which are much longer and more robust than the third and fourth pairs, are of a yellowish-brown hue, with dark-brown streaks, spots, and annuli; each tarsus is terminated by two curved, pectinated claws. The palpi resemble the legs in colour, but are without any dark-brown marks.

The cephalo-thorax is large, convex, slightly compressed before, rounded on the sides, broadly truncated in front, and provided with a few strong, black hairs, particularly on its anterior part; it is of a brownish-black colour, minutely mottled with yellowish-white; a yellowish-white band, whose anterior part is the broadest, and is tinged with brown, extends along the middle, and the margins have a pale, yellowish-white hue. The eyes are disposed on the anterior part of the cephalo-thorax in two transverse, eurved rows, forming a creseent whose convex side is before; the lateral eyes, which are seated on a protuberance whose superior part is whitish, are larger than the intermediate ones, those of the anterior row being the largest of the eight. The falces are short, cuneiform, and vertieal; their colour is yellowish-white, the base and extremity having a brown hue. The maxillæ are pointed at the extremity, and strongly inelined towards the lip, which is triangular. These parts are of a yellowish-brown colour, the base of the latter and a spot on the inner side of the base of the former having a brown hue. The sternum is heart-shaped, and of a yellowish-brown colour, freckled with brown. The abdomen is rather larger at the posterior than at the anterior extremity, sparingly clothed with short hairs, convex above, and projects over the base of the cephalo-thorax; it is of a yellowish-brown colour, with a longitudinal, dark-brown, dentated band on each side of the medial line; a short, transverse, black streak occurs on each dentated band, about one third of its length from the anterior extremity, which is followed by a series of black spots diminishing in size as they approach the spinners; from the exterior angles of the dentated bands oblique, black lines pass to the sides, which are black anteriorly and dark-brown posteriorly, and an obscure, dark line extends from each brown branchial operculum to the spinners, where they meet.

The male bears a near resemblance to the female in colour, but it is more strongly marked, and the under part of its abdomen has a darker hue. Its palpi are short; the humeral and cubital joints are of a yellowish-white colour, the former having a brown-black hue on the upper part, except at the extremity, and the latter being tinged with pale-brown; the radial and digital joints are of a yellowish-brown colour, marked with darker brown; the cubital and radial joints are short, and the latter projects from its extremity, on the outer side, two strong apophyses, the anterior one being somewhat pointed, and the posterior one depressed and rounded at its extremity; the digital joint is oval, with a lobe near the middle of its outer margin; it is convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, not very complex in structure, with a prominent, pointed, eurved proecess projecting beyond the lobe on the outer side of the joint, and are of a very dark-brown colour.

Four immature females and an adult male of this species were taken near Blandford in Dorsetshire, by the Rev. O. P. Cambridge, in 1856.

M. Walckenaer has placed this spider among the synonyma of *Thomisus cristatus*, from which it differs in size and in the design formed by the distribution of its colours; and on referring to M. Koch's 'Uebers. des Arachn. Syst.,' erstes Heft, p. 25, it will be seen that *Thomisus sabulosus* had been confounded with *Thomisus lanio* (*Xysticus lanio*, Koek), by that arachnologist, an error which he afterwards corrected in treating on the species in the twelfth volume of 'Die Arachniden,' p. 66.

## THOMISUS ATOMARIUS. Pl. IV, fig. 42.

*Thomisus atomarius*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 523.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 449.

— *lynceus*, Latr., Gen. Crust. et Insect., tom. i, p. 112.

— *similis*, Wider, Museum Senckenberg., Band i, p. 275, taf. 18, fig. 8.

Length of the female,  $\frac{1}{5}$ th of an inch.

The eyes are disposed on the anterior part of the cephalo-thorax in the form of a crescent; the lateral eyes are larger than the intermediate ones, and those of the anterior row are the largest of the eight. The cephalo-thorax is compressed before, rounded on the sides, broadly truncated in front, and depressed in the anterior region; it is of a brownish-yellow colour, with two longitudinal, dark-brown lines on each side, the exterior ones, which are the longer, being parallel to the lateral margins. The falces, maxillæ, lip, and sternum are of a yellowish-brown hue. The colour of the legs and palpi is pale, brownish-yellow, the former having numerous minute, dark-brown spots distributed over their surface, particularly on the upper part. The first and second pairs of legs are much longer and more robust than the third and fourth pairs, and have the tibiæ and metatarsi provided with strong, sessile spines on the under side. The abdomen is depressed, much broader at the posterior than at the anterior extremity, and projects over the base of the cephalo-thorax; it is of a pale, reddish-brown colour, freckled with dark-brown spots, which are much the most numerous on the upper part; these spots are liable to vary in number, size, and arrangement, in different individuals.

As the *Thomisus lynceus* of Latreille, which M. Walckenaer regards as identical with *Thomisus atomarius*, is stated by Dr. Leach to inhabit Scotland (Supplement to the fourth, fifth, and sixth editions of the 'Encyclopædia Britannica,' article "Annulosa"), it is entitled to a place among British Spiders.

## THOMISUS CINEREUS. Pl. IV, fig. 43.

*Xysticus cinereus*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 26.

— — Koch, Die Arachn., Band iv, p. 63, tab. 126, fig. 290.

Length of the female,  $\frac{1}{5}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{1}{8}$ th; length of an anterior leg,  $\frac{3}{8}$ ths; length of a leg of the third pair,  $\frac{1}{4}$ th.

The cephalo-thorax is large, convex, slightly compressed before, rounded on the sides, truncated in front, and abruptly sloped at the base; it is sparingly clothed with strong hairs,

and of a dark-brown colour, mottled with grayish-brown; a broad band extends along the middle, whose anterior part has a grayish-brown, and its posterior part, which is narrower, a yellowish-white hue; a small, black spot occurs in the middle of the band, at the commencement of the basal slope, and the colour of the lateral margins is yellowish-white. The eyes are disposed on the anterior part of the cephalo-thorax in two transverse, curved rows, forming a crescent; the lateral eyes are seated on a tubercle, and are larger than the intermediate ones, those of the anterior row being the largest of the eight. The falces are short, cuneiform, and vertical; the maxillæ are convex at the base, obliquely truncated at the extremity, on the outer side, and inclined towards the lip; and the sternum is heart-shaped. These parts have a yellow-brown hue, the falces being much the palest in the middle, brownish black on the outer side and at the extremity, and the maxillæ brown at the base. The lip is large, triangular, and of a dark-brown colour, that of the apex being yellowish-brown. The legs are provided with hairs and spines, two parallel rows of the latter occurring on the inferior surface of the tibiæ and metatarsi of the first and second pairs, which are much longer and more robust than the third and fourth pairs; the first pair slightly surpasses the second in length, the third pair is the shortest, and each tarsus is terminated by two curved, pectinated claws; they are of a yellowish-brown hue, the first and second pairs being the brownest, with brown streaks, spots, and annuli. The palpi, which are short, resemble the legs in colour, and have a curved, pectinated claw at their extremity. The abdomen is rather broader at the posterior than at the anterior extremity, somewhat convex above, and projects over the base of the cephalo-thorax; it is thinly clothed with short hairs, and of a gray colour on the upper part, with a strongly dentated, grayish-black band extending along each side of the medial line; these bands, which meet at the spinners, and several of whose exterior angles are produced in oblique lines to the corrugated sides, comprise between them a broad space tinged with brown in its anterior region, where it is marked with five indented spots, forming an angle whose vertex is directed forwards; the anterior extremity of the sides has a grayish-black hue, passing into brown towards the spinners; the colour of the under part is grayish-brown on the sides, and yellowish-brown in the middle, with an obscure, brownish line extending from each brown branchial operculum to the spinners, where the two meet; the sexual organs are well developed, and of a reddish-brown hue, with a broad, longitudinal, yellowish-brown septum in the middle.

An adult female of this species was taken by Mr. James Hardy among heath on a moor near Penmanshiel by Cockburnspath, Berwickshire, in September, 1858.

#### THOMISUS FORMOSUS.

*Thomisus formosus*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. vi, p. 337.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 450.

Length of the female,  $\frac{1}{5}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{12}$ th;

breadth of the abdomen,  $\frac{1}{10}$ th ; length of an anterior leg,  $\frac{1}{20}$ ths ; length of a leg of the third pair,  $\frac{3}{10}$ ths.

The abdomen is oviform, sparingly supplied with hairs, convex above, projecting over the base of the cephalo-thorax ; the upper part is of a bright-red colour, somewhat paler in the medial region, and has a few obscure, transverse lines of a lighter hue above the spinners ; the sides have a yellowish-white tint, and the under part is of a pale-red colour, mottled with yellowish-white spots ; the sexual organs have a brownish-black hue. The cephalo-thorax is large, slightly compressed before, broadly truncated in front, convex, and glossy ; the falces are short, cuneiform, and vertical ; the lip is rather long and triangular ; and the sternum is heart-shaped ; the first and second pairs of legs, which are much longer and more powerful than the third and fourth pairs, are nearly equal in length, the first pair being rather the longer, and are provided with two parallel rows of strong spines on the under side of the tibiæ and metatarsi ; the legs of the third pair are the shortest ; the palpi are short, and have a curved, pectinated claw at their extremity. These parts, which are of a pale-green colour in immature females, have a greenish-yellow hue in adults. The tarsi are terminated by two curved, deeply pectinated claws. The eyes form a crescent on the anterior part of the cephalo-thorax ; the lateral eyes, which are seated on tubercles, are larger than the rest, those of the anterior row being the largest of the eight.

The male, though rather smaller and slenderer than the female, resembles her in colour, with the exception of the cephalo-thorax and its appendages, which have a red hue. The radial joint of its palpi is rather stronger than the cubital, and projects a large, pointed apophysis from its extremity, on the outer side ; the digital joint is oval, compact and pointed at its termination, convex and hairy externally, concave within, comprising the palpal organs, which are moderately developed, not very complicated in structure, and of a red colour.

An adult male and female of this handsome species, captured at Southgate in 1848, the former in May, and the latter in June, are in Mr. Walker's cabinet.

THOMISUS FLORICOLENS. Pl. IV, fig. 44.

*Thomisus floricolens*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 532.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xiv, p. 29.

— *dorsatus*, Hahn, Die Arachn., Band i, p. 44, tab. 11, fig. 34.

— — Koch, Uebers. des Arachn. Syst., erstes Heft, p. 24.

— — Koch, Die Arachn., Band xii, p. 56, tab. 410, figs. 991 and 992.

— — Sund., Vet. Acad. Handl., 1832, p. 221.

Length of the female,  $\frac{1}{5}$ th of an inch ; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{12}$ th ; breadth of the abdomen,  $\frac{1}{8}$ th ; length of an anterior leg,  $\frac{2}{5}$ ths ; length of a leg of the third pair,  $\frac{1}{5}$ th.

The cephalo-thorax is convex, glossy, compressed before, rounded on the sides, truncate



in front, depressed behind, and without an indentation in the medial line; the falces are short, strong, subconical, and vertical; the maxillæ are powerful, convex near the base, and inclined towards the lip, which is somewhat oval; and the sternum is heart-shaped: the legs are provided with a few hairs and some strong spines, two parallel rows of the latter being conspicuous on the inferior surface of the tibiæ and metatarsi of the first and second pairs, which are much longer and more robust than the third and fourth pairs; the first pair is the longest, then the second, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws: the palpi are short, and have a small, curved, pectinated claw at their extremity. These parts have a yellowish-green colour, the maxillæ and lip being the yellowest. The eyes are disposed on the anterior part of the cephalo-thorax in two transverse, curved rows, forming a crescent whose convexity is directed forwards; the eyes of each lateral pair, which are seated on a tubercle, are larger than the intermediate ones, those of the anterior row being the largest of the eight. The abdomen is oviform, broader in the middle than at the extremities, convex above, projecting over the base of the cephalo-thorax; it is of a pale, dull-yellow colour, with a large, oval, dark-brown band extending along the middle of the upper part, whose margin, which is the darkest, presents an irregular outline; the sexual organs have the appearance of two minute, brownish-black spots; and the colour of the branchial opercula is pale-yellow.

The male is smaller and slenderer than the female, but its legs are longer than hers, an anterior one measuring half an inch. It also differs from her in colour, the cephalo-thorax having a reddish-brown hue, with narrow, black, lateral margins, and a deep shade of brown about the region of the eyes. The falces have a pale, reddish-brown tint, with a minute, dark-brown spot near their base, in front. The colour of the maxillæ, lip, and sternum is yellowish-brown. The legs have a reddish-brown hue, with dark-brown annuli, tinged with red, at the extremity of the femora, genua, tibiæ, metatarsi, and tarsi; sometimes the femora have a tinge of green, and are marked with small, red-brown spots, particularly on the under side. The palpi have a yellowish-brown tint, with the exception of the digital joint, which is of a dark-brown colour; the cubital and radial joints are short, the latter projecting two apophyses from its extremity, one situated underneath, and the other, which is bifid at its extremity, on the outer side; the digital joint is oval, pointed at the end, convex and hairy externally, concave within, comprising the palpal organs, which are moderately developed, with a slender, black spine, curved from the outer side round the base, inner side, and extremity, and are of a reddish-brown colour. The dark-brown band on the upper part of the abdomen has a pale, dull-yellow line extending along the middle of its anterior half, and there are several transverse ones of a similar hue on its posterior half; a brownish-black band passes along each side, and the space between the branchial opercula has a red-brown tint.

Adult males and immature females of this species were received from Mr. R. H. Meade, in December, 1853, which had been captured by Mr. Francis Walker, in that and the preceding year, at Piereefield, near Chepstow, in Monmouthshire; and in the autumn of 1854, Mr. Meade met with numerous immature individuals among bushes of box, growing on the chalk-hills of Buckinghamshire.

THOMISUS LUCTUOSUS. Pl. IV, fig. 45.

*Thomisus luctuosus*, Blackw., Lond. and Edinb. Phil. Mag., third series, vol. viii, p. 489.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 450.

Length of the female,  $\frac{5}{16}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{7}$ th, breadth,  $\frac{1}{8}$ th; breadth of the abdomen,  $\frac{11}{32}$ ths; length of a leg of the second pair,  $\frac{1}{3}$ rd; length of a leg of the third pair,  $\frac{1}{4}$ th.

The legs are of a dark-brown colour, streaked and spotted with brown of a deeper shade, and have a yellowish-white hue at the joints; the first and second pairs, which are much longer and more robust than the third and fourth pairs, are nearly equal in length, the second pair being slightly the longer, and the fourth pair surpasses the third in longitudinal extent; each tarsus has two curved, deeply pectinated claws at its extremity. The cephalo-thorax is large, slightly compressed before, rounded on the sides, broadly truncated in front, and depressed in the anterior and posterior regions; it is of a brown colour, veined with lines of a deeper shade, and has a fine, yellowish-white line on the lateral margins; a short, yellowish-white band, bifid before, occupies the medial line near its base, on each side of which there is a spot of the same hue, situated on an irregular black patch; and a faint, brownish-white spot occurs on the inner side of the tubercles on which the anterior eyes of the lateral pairs are seated. The falces are short, strong, cuneiform, and vertical; the sternum is oblong heart-shaped; the maxillæ are convex at the base; and the lip is triangular. These parts are of a dark-brown colour, the first two being mottled with lighter brown, and the extremities of the last two being much paler than their bases. The palpi have a dark-brown hue, and are terminated by a curved, pectinated claw. The eyes form a crescent on the anterior part of the cephalo-thorax; the lateral eyes, which are seated on tubercles, are larger than the rest, those of the anterior row being the largest of the eight. The abdomen is depressed, sparingly supplied with hairs, slightly corrugated on the sides, much broader at the posterior than at the anterior extremity, and projects over the base of the cephalo-thorax; its colour is yellowish-gray, mottled with black and dull-white; an obscure, light-coloured band, which subtends a few whitish streaks from each side towards the middle, encircles the upper part, and there are several short, curved, transverse, whitish lines above the spinners; the sexual organs and the branchial opercula have a reddish-brown hue. The abdomen of the female, after she has deposited her eggs, becomes much more corrugated and darker coloured.

The male is smaller, darker, and more distinctly marked than the female. The femora and tibiæ of the first and second pairs of legs are of a very dark-brown colour, tinged with red, and those of the third and fourth pairs have a reddish-brown tint, the anterior extremity of the femora being the darkest; the metatarsi and tarsi of all the legs are of a pale, reddish-brown hue. The palpi are of a reddish-brown colour, the humeral joint being much the darkest, and the digital joint the palest; the cubital and radial joints are short; the

latter projects a long, pointed apophysis from its extremity, on the outer side, and a strong, prominent one, terminating in the form of a crescent, on the under side; the digital joint is oval, with a small, acute process on the outer side, against the base of which the end of the pointed apophysis connected with the radial joint applies; it is convex and hairy externally, concave within, and comprises the palpal organs; these organs are moderately developed, and have a spine curved round their extremity, whose point terminates in a cavity of the small, acute process on the outer side of the digital joint; their colour is dark, reddish-brown.

*Thomisus luctuosus* is found among coarse herbage growing in woods and pastures about Oakland. In July, the female constructs a lenticular cocoon of white silk, of a compact texture, measuring  $\frac{1}{4}$ th of an inch in diameter, and deposits in it between eighty and ninety spherical eggs, of a pale, yellowish-white colour, not agglutinated together. The cocoon, to which the female manifests her attachment by remaining constantly with it, is often placed between two leaves, connected by a slight tissue of silk, forming a kind of sac.

This spider appears to be nearly allied to the *Thomisus fucatus* of M. Walckenaer (Hist. Nat. des Insect. Apt., tom. i, p. 505).

THOMASUS BIFASCIATUS. Pl. IV, fig. 46.

*Thomisus bifasciatus*, Blackw., Linn. Trans., vol. xix, p. 122.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 450.

*Xysticus* — Koch, Die Arachn., Band iv, p. 59, tab. 125, figs. 286—288.

— — Koch, Uebers. des Arachn. Syst., erstes Heft, p. 26.

Length of the female,  $\frac{3}{10}$ ths of an inch; length of the cephalo-thorax,  $\frac{3}{20}$ ths, breadth,  $\frac{1}{7}$ th; breadth of the abdomen,  $\frac{1}{6}$ th; length of a leg of the second pair,  $\frac{9}{20}$ ths; length of a leg of the third pair,  $\frac{7}{24}$ ths.

The cephalo-thorax is large, glossy, slightly compressed before, rounded on the sides, broadly truncated in front, and depressed in the anterior and posterior regions; it is of a pale, red-brown colour, with a longitudinal, dark-brown band immediately above each lateral margin, and another of the same hue extending backwards from each lateral pair of eyes; on the anterior part of the space comprised between the latter bands, there are two pale-yellow lines, which meet in an angle directed towards the abdomen, and a transverse line of the same colour passes between the two rows of eyes. The falces are short, cuneiform, and vertical; the maxillæ are enlarged where the palpi are inserted, and convex near the base; and the lip is rather long and triangular. These parts are of a pale, red-brown colour, except the base of the lip, which is blackish. The sternum is oblong heart-shaped, thinly covered with strong black hairs, and of a pale, red-brown colour, with dark-brown spots, the largest of which, situated at its posterior extremity, is of an elongated form. The first and second pairs of legs are much longer and more powerful than the third and

fourth pairs, and are nearly equal in length, the second pair being slightly the longer and the fourth pair a little surpasses the third in longitudinal extent; they are provided with hairs and strong spines, and are of a pale, red-brown colour, the femora and tibiae of the first and second pairs being marked on the upper part with two obscure, longitudinal, parallel lines, one of which has a blackish and the other a yellowish-white tint; each tarsus has two curved, deeply pectinated claws at its extremity. The palpi are of a pale, red-brown hue, and are provided with hairs and strong spines. The eyes are disposed on the anterior part of the cephalo-thorax in the form of a crescent; the lateral eyes of both rows, which are seated on tubercles, are larger than the rest, those of the anterior row being the largest of the eight. The abdomen is depressed, sparingly supplied with hairs, broader at the posterior than at the anterior extremity, and projects over the base of the cephalo-thorax; it is of a red-brown colour above, being palest in the middle of the anterior region, and is encircled by a band of dull, reddish-white, which subtends several streaks of the same hue from each side towards the middle; there are on the upper part five conspicuous, circular depressions; the three anterior ones form a triangle whose vertex is directed forwards, and the other two are situated parallel to its base; the sides and under part are corrugated, and of a reddish-brown colour, that of the spinners being brownish; the branchial opercula have a pale, dull-yellow tint; and the sexual organs, which are prominent and have an orifice nearly circular, are of a red-brown hue.

The male, which is smaller and much darker coloured than the female, bears a strong resemblance to the male of *Thomisus luctuosus*. The femora and genua of its first and second pairs of legs are of a very dark-brown colour, the remaining parts of these limbs, and the whole of the third and fourth pairs, having a reddish-brown hue. The colour of the palpi is red-brown; the cubital and radial joints are short, and the latter projects from its extremity a large, pointed apophysis, on the outer side, and a strong obtuse one underneath; the digital joint is oval, with a bold projection near the upper part, on the outer side; it is convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, and have two curved, pointed, prominent, contiguous processes near their middle, one of which has a conical protuberance at its base, on the outer side; a large spine, whose point terminates in the bold projection on the outer side of the digital joint, curves round their extremity, and their colour is black, tinged with red.

In spring this species may be observed running on the ground, in pastures near Llanrwst. The female constructs a lenticular cocoon of white silk, of a compact texture, measuring two fifths of an inch in diameter, on the inferior surface of the leaves of plants, the edges of which are folded upon it, and retained in that position by silken lines; it comprises about 185 spherical eggs of a yellowish-white colour, not agglutinated together, which are hatched in July.

An adult female, taken in May 1846, had the right eye of the posterior row very much smaller than the left eye of the same row.

## THOMISUS CAMBRIDGII. Pl. IV, fig. 47.

*Thomisus Cambridgii*, Blackw., Annals and Mag. of Nat. Hist., third series, vol. 1, p. 426.

Length of the female,  $\frac{3}{10}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{3}{20}$ ths; length of an anterior leg,  $\frac{7}{20}$ ths; length of a leg of the third pair,  $\frac{1}{4}$ th.

The eyes are disposed on the anterior part of the cephalo-thorax in two transverse, curved rows, forming a crescent whose convexity is directed forwards; the eyes of each lateral pair, which are seated on a tubercle, are larger than the intermediate ones, those of the anterior row being the largest of the eight. The cephalo-thorax is large, convex, compressed before, rounded on the sides, broadly truncated in front, depressed anteriorly, still more abruptly so towards the base, and has a small indentation in the medial line; the sides are of a brown colour, marbled with yellowish-white, and on the posterior part of each there is an oval black patch, with its smaller extremity directed forwards, whose outer margin is broken by a yellowish-white spot; the lateral margins and a large band extending along the middle are of a yellowish-white colour, the latter, immediately behind the eyes, being tinged with brown and marked with spots and two short, parallel streaks of a deeper shade; a short, curved, black line occurs near each side, below the lateral eyes, and the frontal margin is fringed with a row of strong, black hairs directed forwards. The falces are short, powerful, subconical, vertical, and of a yellowish-white colour in front; the base, outer side, and extremity having a brownish-black hue. The maxillæ are somewhat pointed at the extremity, and inclined towards the lip, which is triangular, but rounded at the apex; and the sternum is heart-shaped. These parts are of a pale, brownish-yellow colour, the base of the lip, that of the maxillæ on the inner side, and minute spots on the sternum, having a dark-brown hue. The legs are provided with hairs and spines, two longitudinal rows of the latter occurring on the inferior surface of the tibiæ and metatarsi of the first and second pairs; they are of a brownish-yellowish colour, the tarsi having a tinge of red, and are marked with streaks, spots, and annuli, of a brownish-black hue; the first and second pairs, which are longer and more robust than the third and fourth pairs, are equal in length, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws; and the short palpi, which resemble the legs in colour, but are very slightly marked with brownish-black, have a curved, pectinated claw at their extremity. The abdomen is broader at the posterior than at the anterior extremity, sparingly clothed with hairs, convex above, and projects over the base of the cephalo-thorax; the upper part is of a dull, reddish-brown colour, with obscure, slightly oblique lines of a paler hue, and is marked with seven minute, indented, yellowish-white spots, describing an elongated angle whose vertex is directed forwards; a short, fusiform line, of the same hue, extends along the middle from the spot forming the vertex of the angle, a little beyond the two spots constituting the second pair; the anterior extremity, sides, a space above the



spinners, and the under part, are of a pale, brownish-yellow colour; on the first there is a curved, black band extending to the anterior part of the sides, which are marked with oblique, imperfectly defined, black streaks, and on the posterior extremity spots of the same hue are disposed in longitudinal rows; the under part is minutely spotted with brown, and a brown line on each side of the middle region extends to the spinners, the superior and inferior pairs of which have the second joint of a dark-brown hue; the colour of the sexual organs and branchial opercula is reddish-brown, and immediately below each of the latter there is an irregular, black spot.

The Rev. O. P. Cambridge captured this handsome *Thomisus* in Dorsetshire, in the autumn of 1857.

THOMISUS PALLIDUS. Pl. IV, fig. 48.

*Thomisus pallidus*, Blackw., Annals and Mag. of Nat. Hist., vol. xviii, p. 299.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 450.

Length of the female,  $\frac{11}{32}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{11}$ th; breadth of the abdomen,  $\frac{1}{7}$ th; length of a leg of the second pair,  $\frac{1}{4}$ th; length of a leg of the third pair,  $\frac{3}{20}$ ths.

The falces are short, subconical, vertical, and are furnished with some erect bristles in front, towards the inner side; the maxillæ are convex near the base; the lip is triangular; and the sternum is heart-shaped; the legs are provided with hairs and strong spines; the first and second pairs are longer and more robust than the third and fourth pairs, and are nearly equal in length, the second pair being rather the longer; and the fourth pair surpasses the third in longitudinal extent; the palpi are short, and are supplied with hairs and spines. These parts are of a pale, yellowish-brown colour, the lip being somewhat the darkest. Each tarsus is terminated by two curved, pectinated claws, and the palpi have a small, curved, pectinated claw at their extremity. The cephalo-thorax is compressed before, rounded on the sides, broadly truncated in front, and depressed in the posterior region; its colour is yellowish-brown, the lateral margins being the palest, and an obscure, reddish-brown band is directed backwards from each lateral pair of eyes. The eyes are arranged in the form of a crescent on the anterior part of the cephalo-thorax; the lateral eyes are seated on tubercles, and are larger than the rest, those of the anterior row being the largest of the eight. The abdomen is depressed, corrugated, much broader at the posterior than at the anterior extremity, the latter, which appears as if cut in a straight line across, projecting over the base of the cephalo-thorax; short, strong hairs are sparingly distributed over its superior surface, and its colour is pale, yellowish-brown; there are on the upper part five conspicuous, circular depressions; the three anterior ones form a triangle whose vertex is directed forwards, and the other two are situated parallel to its base; the sexual organs are of a red-brown hue; and the branchial opercula have a pale-yellow tint.

This spider was discovered among grass in a pasture at Oakland, in September 1845; and in April 1849 an adult female was received from Mr. James Hardy, of Penmanshiel, Berwickshire, who found it under a stone in Penmanshiel Wood. Like *Thomisus cristatus*, *Thomisus bifasciatus*, and some other species belonging to the genus *Thomisus*, it has the power of changing the colour of the anterior intermediate pair of eyes from dark, red-brown to pale, golden-yellow by a very perceptible internal motion. No such motion appears to occur in the other eyes, which are always black.

THOMISUS VERSUTUS. Pl. IV, fig. 49.

*Thomisus versutus*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. xi, p. 15.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xi, p. 114.

Length of the female,  $\frac{1}{5}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{15}$ th; breadth of the abdomen,  $\frac{1}{5}$ th; length of an anterior leg,  $\frac{11}{43}$ ths; length of a leg of the third pair,  $\frac{1}{5}$ th.

The legs are provided with short hairs and strong spines, two parallel rows of the latter being conspicuous on the inferior surface of the tibiae and metatarsi of the first and second pairs, which are much longer and more robust than the third and fourth pairs; the first pair is rather longer than the second, and the third pair is the shortest; each tarsus is terminated by two curved, black claws, dentated near the base; the palpi, which are short, are supplied with hairs and spines, and have a small, curved, black claw at their extremity; the cephalo-thorax is convex, compressed before, and rounded on the sides and in front; it slopes abruptly behind, is without an indentation in the medial line, and on its frontal margin there is a row of strong bristles directed forwards; the falcæ are short, strong, subconical, vertical, and have some bristles in front, towards the inner side; the maxillæ are slender, convex near the base, pointed at the extremity, and inclined towards the lip, which is triangular; the sternum is heart-shaped. These parts are of a pale, yellowish-brown colour; the cephalo-thorax has a brownish-black band extending backwards from each lateral pair of eyes, and narrow, yellowish-white margins; and the lip has an oblong, dark-brown spot near its base. The eyes are disposed on the anterior part of the cephalo-thorax in two curved rows, forming a crescent whose convex side is in front; the eyes of each lateral pair, which are seated on a tubercle, are much larger than the intermediate ones, those of the anterior row being the largest of the eight. The abdomen is depressed, corrugated, particularly on the sides, much broader at the posterior than at the anterior extremity, the latter, which appears as if cut in a straight line across, projecting over the base of the cephalo-thorax; very short hairs are sparingly distributed over its surface, and it is of a yellowish-gray colour, freckled with brown, a broad, dentated band, which is bordered laterally with red-brown, extending along the

middle of the upper part; the anterior part of this band comprises five conspicuous, brown depressions; the three anterior ones describe a triangle whose vertex is directed forwards, and the other two are situated parallel to its base; two obscure, brown lines, forming a very acute angle whose vertex is directed backwards, occur between the depressions constituting the two posterior pairs; the sexual organs have a dark, reddish-brown tint; and the colour of the branchial opercula is pale-yellow.

The male is much smaller, darker coloured, and less distinctly marked than the female. The cephalo-thorax has a red-brown hue, the band directed backwards from each lateral pair of eyes is black, and the lateral margins have a yellowish-white tint. The legs and sternum are of a red-brown colour, the latter being marbled with a deeper shade of red-brown. The falces have a brownish-black hue, with a red-brown mark in front which extends to the outer side. The maxillæ and lip have a dark-brown tint, their extremities being the palest. The axillary and humeral joints of the palpi are of a dark-brown colour, tinged with red; the cubital and radial joints are of a red-brown hue, tinged with dark-brown, the latter being the darker, and the digital joint has a dark-brown tint; the radial joint is larger than the cubital, and projects from its extremity, on the outer side, two bifid apophyses; one branch of the superior apophysis is prominent, and the other is in close contact with the base of the digital joint, which joint is oval, convex, and hairy externally, concave within, comprising the palpal organs; these organs are highly developed, complex in structure, with a pointed, prominent process at their base, and have a brownish-black tint. The upper part of the abdomen is of a red-brown colour, interspersed with a few black spots; it is palest in the medial line, but the design of the broad, dentated band is almost obliterated; the frontal margin and a band extending along each side have a yellowish-white tint, and the under part is of a pale, red-brown colour.

The abdomen of both sexes, when adolescent, is of a pale-yellow colour, with a few black spots on the upper part.

Adult and immature individuals of this species of *Thomisus* were discovered among grass growing in and near woods at Oakland, in August, 1852; and in 1858 specimens, taken in Scotland, were received from Mr. J. Hardy.

**THOMISUS TRUX.** Pl. IV, fig. 50.

*Thomisus trux*, Blackw., Annals and Mag. of Nat. Hist., vol. xviii, p. 300.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 451.

Length of the male,  $\frac{1}{7}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{12}$ th, breadth,  $\frac{1}{14}$ th; breadth of the abdomen,  $\frac{1}{14}$ th; length of a leg of the second pair,  $\frac{1}{3}$ th; length of a leg of the third pair,  $\frac{1}{7}$ th.

The legs are robust, and are provided with hairs and spines; they are of a yellowish-

brown colour, with the exception of the femora; those of the first pair, the anterior half of those of the second pair, and the extremity of those of the third and fourth pairs having a brownish-black hue, faintly tinged with red; the first and second pairs are longer than the third and fourth pairs, and are nearly equal in length, the second pair being slightly the longer, and the fourth pair surpasses the third in longitudinal extent; each tarsus is terminated by two curved, pectinated claws. The palpi are short; the colour of the humeral and digital joints is dark-brown, that of the cubital joint is yellowish-brown, and the hue of the radial joint is reddish-brown; the radial is much stronger than the cubital joint, and projects from its extremity, on the outer side, a slender, slightly curved, pointed apophysis, which is very prominent, and an obtuse one, situated underneath, which has a process at its base, on the outer side; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs; these organs are highly developed, complicated in structure, with a strong, prominent point near the middle, a filiform spine curved from the outer side round their extremity, and are of a dark-brown colour, tinged with red. The cephalo-thorax is compressed before, rounded on the sides, truncated in front, and abruptly depressed at the base; the sides are black, marked with a longitudinal band of a clear, red-brown colour, and a broad band of the latter hue extends along the middle. The eyes form a crescent on the anterior part of the cephalo-thorax; the lateral eyes are seated on tubercles, and are larger than the intermediate ones, those of the anterior row being the largest of the eight. The falces are short, subconical, vertical, and of a dark-brown colour, with a red-brown spot in front. The maxillæ are convex near the base, and enlarged where the palpi are inserted; and the lip is triangular. These parts have a brown tint. The sternum is heart-shaped, and of a yellowish-brown hue. The abdomen is depressed, corrugated, particularly on the sides, sparingly supplied with short, strong hairs, and is broader at the posterior than at the anterior extremity, the latter, which appears as if cut in a straight line across, projecting over the base of the cephalo-thorax; it is of a yellowish-brown colour above, encircled by a band of yellowish-white; on each side of the medial line there is a broad, irregular, longitudinal band of a dark-brown hue extending nearly to the spinners, immediately above which organs there are several transverse, yellowish-white streaks; in the middle of the space included between the dark-brown bands there are two dark-brown lines forming a very acute angle whose vertex is directed backwards, and in its anterior part there are five circular, yellowish-brown depressions; three are disposed in the form of a triangle, having its vertex directed forwards, and the other two are situated parallel to its base; the sides and under part are of a dark-brown hue, mottled with yellowish-brown; and the spinners and branchial opercula are of a yellowish-brown colour.

An adult male of this species was taken among grass in a pasture at Oakland, in June, 1846; and several individuals of the same sex have since been met with running on the ground in fields near Llanrwst. Males of *Thomisus trux* have also been captured in Scotland, by Mr. J. Hardy.

## THOMISUS INCERTUS. Pl. IV, fig. 51.

*Thomisus incertus*, Blackw., Annals and Mag. of Nat. Hist., vol. xviii, p. 297.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 451.

Length of the female,  $\frac{3}{16}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{16}$ th, breadth,  $\frac{1}{16}$ th; breadth of the abdomen,  $\frac{1}{16}$ th; length of an anterior leg,  $\frac{3}{16}$ ths; length of a leg of the third pair,  $\frac{1}{11}$ th.

The legs are robust, provided with hairs and spines, and are of a pale, reddish-brown colour, with annuli and spots of a dark-brown hue; the first and second pairs are equal in length, the latter extending a little wider in consequence of being articulated to a broader part of the cephalo-thorax, and the fourth pair is rather longer than the third; each tarsus is terminated by two curved, pectinated claws. The palpi, which are short, resemble the legs in colour, and have a curved, pectinated claw at their extremity. The eyes are disposed in the form of a crescent on the anterior part of the cephalo-thorax; the lateral eyes, which are seated on tubercles, are larger than the intermediate ones, those of the anterior row being the largest of the eight. The cephalo-thorax is compressed before, rounded on the sides, truncated in front, and abruptly depressed in the posterior region; on each side there is a broad, dark-brown band comprising several irregular, red-brown marks; the medial line is of a red-brown colour, and the lateral margins are whitish. The falces are short, subconical, vertical, and of a dark-brown hue, tinged with red, especially near the base, in front. The maxillæ are enlarged where the palpi are inserted, and convex near the base; and the lip is triangular. These parts are of a red-brown colour, the base of the lip being much the darkest. The sternum is heart-shaped, and has three or four dark-brown spots on each side, and a streak of the same hue extending from its posterior extremity to the middle. The abdomen is depressed, sparingly supplied with short, strong hairs, broader at the posterior than at the anterior extremity, and projects over the base of the cephalo-thorax; its colour is dull, yellowish-brown, with oblique, brownish-black bars on each side of the medial line, whose length and distance from each other diminish as they approach the spinners; a yellowish-brown band, which tapers to a point at its posterior extremity, extends along the middle, and includes two obscure, parallel, brownish-black lines in its broad, anterior part; the sides and under part are spotted with brownish-black, the former the more densely, and the sexual organs have a reddish-brown hue.

The sexes differ in various particulars. The male is smaller than the female, and the femora of its anterior pair of legs are black, faintly tinged with red on the sides and under part; the other joints of these limbs have a pale, reddish-brown hue, with a few dark spots on the sides of the genua and the base of the tibiæ; the second pair of legs resembles the first pair, except that the base of the femora is of a pale, reddish-brown colour; the third and fourth pairs have a pale, reddish-brown tint, with a few brownish-black annuli. The humeral



joint of the palpi is of a brownish-black hue, being palest at the base, and that of the eubital and radial joints is reddish-brown, obscurely marked with dark-brown; a long, brownish-black, curved apophysis, which is recurved at the point, projects from the extremity of the radial joint, on the outer side, and a crescent-shaped one of a reddish-brown hue is situated underneath; the digital joint is oval, of a dark-brown hue, convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, complicated in structure, with a black spine curved round their extremity, and are of a reddish-brown colour. The abdomen is of a dark-brown hue, obscurely tinged with reddish-brown; the sides are mottled with yellowish-white, and the branchial opercula have a dark, reddish-brown tint.

A male of this spider, with its palpal organs fully developed, was discovered in an out-building at Oakland, in June, 1845; and in the spring of 1850 an adult female was received from Miss Ellen Clayton, who captured it in Dorsetshire. Another female, having the ground-colour of its abdomen yellowish-red, was taken early in 1851, at Bradford, in Yorkshire, by Mr. R. H. Meade.

In June, 1852, a female *Thomisus incertus*, confined in a phial, fabricated a lenticular cocoon of white silk, of a compact texture, which she attached to the glass. This cocoon measured one fourth of an inch in diameter, and contained twenty whitish eggs of a spherical form, not adherent among themselves.

#### THOMISUS CLAVEATUS. Pl. IV, fig. 52.

*Thomisus claveatus*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 510.

Length of the female,  $\frac{1}{8}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{1}{12}$ th; length of a leg of the second pair,  $\frac{1}{8}$ th; length of a leg of the third pair,  $\frac{1}{10}$ th.

The eyes are disposed on the anterior part of the cephalo-thorax in two transverse, curved rows, forming a crescent whose convex side is before; the lateral eyes, which are seated on a slight protuberance, and are wide apart, are larger than the intermediate ones, those of the anterior row being much the largest of the eight. The cephalo-thorax is small, convex, rugose, compressed before, rounded on the sides, abruptly depressed at the base, and is supplied with short, strong hairs enlarged at their extremity, which abound most in the medial line and in front, and is of a dark-brown colour, tinged with red; a broad, dull, reddish-brown band extends along the middle, and the lateral margins have a yellowish-white hue. The falcæ are short, cuneiform, and vertical; the maxillæ are pointed at the extremity, and strongly inclined towards the lip, which is triangular; and the sternum is heart-shaped. These parts have a yellowish-brown colour, the falcæ and lip being the darkest. The legs are provided with hairs and spines, two parallel rows of the latter extending along the inferior surface of the tibiæ and metatarsi of the first and second pairs, which are longer and more robust than the third and fourth pairs; the second pair is slightly longer than the first, and the third pair is rather the shortest; they have a brown hue intermixed with yellowish-

brown, the femora and the base of the tibiæ being the darkest; each tarsus is terminated by two curved, pectinated claws. The palpi are short, and resemble the legs in colour, but are somewhat paler. The abdomen is broadest in the middle, corrugated on the sides and at the posterior extremity, which is rounded, moderately convex above, and projects a little over the base of the cephalo-thorax; short, strong hairs, enlarged at their extremity, are dispersed over its superior surface, but are most abundant on the sides; its colour is yellow-brown, the sides and under part being much the palest; on the posterior half of the upper part there are dark-brown, slightly curved, transverse bars, which diminish in length as they approach the spinners, and in the medial line of the anterior part two rows of confluent, dark-brown spots form a very acute angle, whose vertex is directed backwards; the sides are marked with dark-brown streaks and spots, and from each pale-yellow branchial operculum a row of confluent, dark-brown spots passes obliquely to the spinners; the sexual organs have a broad, prominent piece, slightly notched at its extremity, connected with their anterior margin, and their colour is red-brown.

The male bears a close resemblance to the female, but it is smaller, darker coloured, and its legs are slenderer. Its palpi are short, and the colour of the humeral, radial, and digital joints is brown, the humeral joint being the palest, and the cubital joint has a yellowish-brown hue; the radial joint projects a long, curved, pointed, prominent apophysis from its extremity, on the outer side, and a strong, obtuse one, notched at its extremity, on the under side; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, not very complex in structure, and of a dark-brown colour, tinged with red.

Specimens of this remarkable *Thomisus* have been taken in Portland on several occasions, by the Rev. O. P. Cambridge.

THOMISUS CITREUS. Pl. IV, fig. 53.

*Thomisus citreus*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 526.

— — Latr., Gen. Crust. et Insect., tom. i, p. 111.

— — Hahn, Die Arachn., Band i, p. 42, tab. 11, fig. 32.

— — Sund., Vet. Acad. Handl., 1832, p. 219.

— — Blackw., Linn. Trans., vol. xix, p. 122.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 451.

— *dauci*, Hahn, Die Arachn., Band i, p. 33, tab. 9, fig. 27.

— *calycinus*, Koch, Die Arachn., Band iv, p. 53, tab. 124, figs. 283, 284.

— — Koch, Uebers. des Arachn. Syst., erstes Heft, p. 24.

Length of the female,  $\frac{7}{16}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{8}$ th; breadth of the abdomen,  $\frac{1}{4}$ th; length of an anterior leg,  $\frac{1}{2}$ ; length of a leg of the third pair,  $\frac{1}{4}$ th.

The eyes are disposed on the anterior part of the cephalo-thorax, in two transverse rows, forming a crescent; those of the anterior row are slightly larger than those of the posterior row, and the lateral pairs are seated on tubercles. The cephalo-thorax is compressed before, rounded on the sides, broadly truncated in front, and depressed in the posterior part; its colour is dull-yellow, a broad, longitudinal band in the medial line, the lateral margins, and the region of the eyes, being of a paler hue, and a band of a dull-green colour extends along each side. The falces are short, strong, and vertical; the maxillæ are enlarged where the palpi are inserted, and convex at the base; the lip, which is somewhat oval, is pointed at the apex; and the sternum is heart-shaped. The first and second pairs of legs are much longer and more powerful than the third and fourth pairs, and their metatarsi are provided with two longitudinal rows of strong spines on the under side; the first pair of legs is rather longer than the second pair, and the third pair is the shortest; each tarsus is terminated by two curved, deeply pectinated, black claws; the palpi are short, and have a curved, pectinated claw at their extremity; the abdomen is depressed, much broader at the posterior than at the anterior extremity, and projects over the base of the cephalo-thorax. These parts are of a yellow colour, differing in intensity, and the maxillæ have a tinge of brown. On the upper part of the abdomen there are two longitudinal series of minute depressions, which converge to a point near its anterior extremity; and in the medial line of the under part two parallel series of similar depressions occur. Much diversity of colour may be observed even among adult females of this species, the prevailing tint in some individuals being yellow, and in others pale-green, greenish-yellow, or white; and in many instances the sides of the anterior part of the abdomen are marked with an irregular, longitudinal, red band.

The male is only half the length of the female, and differs from her remarkably in colour. The sides of its cephalo-thorax have a brownish-black hue, a broad band of yellowish-green extends along the middle, and the region of the anterior intermediate pair of eyes and the frontal margin are of a dull-red colour. The falces, maxillæ, lip, and sternum are of a dark, reddish-brown hue, the extremities of the first three having a greenish-yellow tint. The first and second pairs of legs are of a dark, reddish-brown colour, with broad annuli of yellowish-brown on the tibiæ, metatarsi, and tarsi; the third and fourth pairs have a dull, greenish-yellow hue, with the exception of the coxæ, which are of a dark, reddish-brown colour. The colour of the axillary, humeral, and digital joints of the palpi is dark, reddish-brown, the last having a yellowish-brown tinge at the extremity; the cubital and radial joints are short, and of a greenish-yellow hue; the former is the larger, and the latter projects a large apophysis from its extremity, on the outer side, which terminates in an acute, curved point; at the base of the apophysis, underneath, there are two obtuse prominences, and intermediate between them and its curved point another is situated; the digital joint is of a broad, oval form, convex and hairy externally, concave within, comprising the palpal organs; these organs, though highly developed, are not very complicated in structure; they have a small, curved spine at their extremity, on the outer side, and are of a dark, reddish-brown colour. The abdomen is oviform, somewhat depressed, of a pale, greenish-yellow colour above, with an irregular, brownish-black band extending from the spinners, on each side of the medial line, about two thirds of its length; on the sides there is an irregular band of the same hue, which unites with the other bands at the spinners; and the under part has a broad, longitudinal, dark, reddish-brown band in the middle, bordered laterally with red-brown.

Flowers growing in fields and gardens are the favorite resorts of *Thomisus citreus*, which occurs in various parts of England and Wales. The great dissimilarity in size and colour between the sexes has occasioned them to be described as different species.

THOMISUS ABBREVIATUS. Pl. IV, fig. 54.

*Thomisus abbreviatus*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 516.

— *diadema*, Hahn, Die Arachn., Band i, p. 49, tab. 13, fig. 37.

— — Koch, Uebers. des Arachn. Syst., erstes Heft, p. 24.

— — Koch, Die Arachn., Band iv, p. 51, tab. 123, figs. 281, 282.

Length of the female,  $\frac{3}{8}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{3}{16}$ ths; breadth of the abdomen,  $\frac{1}{4}$ th; length of an anterior leg,  $\frac{11}{16}$ ths; length of a leg of the third pair,  $\frac{1}{4}$ th.

The cephalo-thorax is convex, somewhat glossy, rounded in front and on the sides, abruptly sloped at the base, and has a prominent, conical tubercle on each side, in the region of the eyes, and a small process projecting from the middle of the frontal margin; it is of a brown colour, tinged with yellow towards the sides, and has a broad band extending from its anterior extremity along the middle, more than two thirds of its length, and lateral margins of a pale-yellow, or yellowish-white hue. The eyes are disposed on the anterior part of the cephalo-thorax in two transverse, curved rows, forming a crescent whose convexity is directed forwards; the eyes of the anterior row are rather larger than those of the posterior row, and the lateral eyes of both rows are seated on the conical tubercles, below their apex. The falces are short, strong, cuneiform, and vertical; the maxillæ are convex at the base, enlarged at the extremity, which is truncated on the outer side, and inclined towards the lip, which has an oblong-oval figure; and the sternum is heart-shaped. These parts have a pale-yellow or yellowish-white hue; the lip is the darkest, and the falces have a brown spot at their base, in front. The legs are very unequal in length, the first and second pairs being much longer and more robust than the third and fourth pairs; they are provided with short hairs and spines, two parallel rows of the latter occurring on the inferior surface of the metatarsi and the extremity of the tibiæ of the first and second pairs, and are of a yellow colour, tinged with brown on the upper surface of the femur, genual joint, and tibia; the first pair is slightly longer than the second, the third pair is the shortest, and each tarsus is terminated by two curved, pectinated claws. The palpi, which are short, resemble the legs in colour, and have a curved, pectinated claw at their extremity. The abdomen is large, broad, abruptly curved downwards in the posterior region, and has a conical protuberance on the upper part of each side, near the middle of its length; it is thinly clothed with short hairs, and of a yellow colour, the under part, which is the palest, having a row of minute, indented spots extending along each side of the medial line, and in the anterior region of the upper part there are five indented spots, disposed in the form of an acute angle, whose vertex is directed forwards; the sexual organs are small, and of a red-brown hue, with a longitudinal, brownish-yellow septum in the middle.

This species varies considerably in colour, particularly when immature. In numerous instances the abdomen has a yellowish-white hue; a small, angular or semicircular pink spot occurs at the anterior extremity of the upper part, to which succeed several oblique streaks and a transverse line connecting the two conical protuberances, of the same colour, and on the abruptly curved posterior part there are transverse pink lines, which extend along the sides.

The immature male, which has to undergo its final ecdysis, closely resembles the female, but is smaller, and the digital joint of its palpi is tumid.

A young individual of this species was taken in Dorsetshire, by the Rev. O. P. Cambridge, in the autumn of 1857, and in 1858 several immature specimens of both sexes were captured by him at Lyndhurst, in the New Forest.

*Genus* PHILODROMUS (*Walckenaer*).

*Eyes* disposed on the anterior part of the cephalo-thorax in two transverse, curved rows, forming a crescent whose convex side is in front; they do not differ greatly in size.

*Maxillæ* inclined towards the lip and convergent at their extremities.

*Lip* either triangular or somewhat oval.

*Legs* so articulated as to be extended laterally; they are long, and vary in their relative length in different species.

PHILODROMUS DISPAR. Pl. V, fig. 55.

*Philodromus dispar*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 553.

— — Blackw., Linn. Trans., vol. xix, p. 123.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 451.

— *fallax*, Sund., Vet. Acad. Handl., 1832, p. 226.

— *limbatus*, Koch, Die Arachn., Band xii, p. 85, tab. 416, figs. 1017, 1018.

Length of the female,  $\frac{11}{48}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{12}$ th, breadth,  $\frac{1}{13}$ th; breadth of the abdomen,  $\frac{1}{6}$ th; length of a leg of the second pair,  $\frac{1}{3}$ rd; length of a leg of the third pair,  $\frac{13}{48}$ ths.

The legs are long, and are provided with hairs and sessile spines; they are of a pale, yellowish-brown colour, faintly tinged with green, and are marked with numerous, minute, black spots; the second pair is the longest, then the first, and the fourth pair is rather longer



than the third; each tarsus is terminated by two curved, pectinated claws, and below them a small scopula is situated. The palpi, which are short, resemble the legs in colour, and have a curved, pectinated claw at their extremity. The cephalo-thorax is short, broad, compressed before, rounded on the sides, convex and hairy; it is of a yellowish-brown colour, with a large, longitudinal, dark-brown band on each side. The eyes are disposed on the anterior part of the cephalo-thorax, in the form of a crescent; the lateral eyes are seated on tubercles, those of the posterior row being rather the largest of the eight. The falces are small, conical, and vertical; and the maxillæ are gibbous near the base. These parts are of a yellowish-brown colour. The lip is triangular, rounded at the apex, and has a dark-brown hue, with yellowish-brown margins. The sternum is heart-shaped, and of a yellowish-brown colour, with numerous minute, black spots. The abdomen is broader in the posterior than in the anterior region, but is pointed at the spinners; it is somewhat convex above, and projects a little over the base of the cephalo-thorax; the whole is covered with short hairs, those on the upper part being of a gray colour in the middle of the anterior extremity, which is notched, and of a glossy, yellow hue on the posterior part; when the hairs are removed, a dark-brown band is observed to occupy the medial line of the anterior half, and to it there succeeds a series of curved bars of the same colour, which are enlarged at their extremities, and decrease in length as they approach the spinners; an irregular, dark-brown band extends along the upper part of each side to the anus, where the two unite; the sides and under part are of a gray colour, the former being spotted with dark-brown, and the latter having a broad, longitudinal, dull-brown band in the middle; the sexual organs have a reddish-brown hue; and that of the branchial opercula is yellow.

The male differs widely from the female; it is smaller, and the length of its legs is greater, a leg of the second pair measuring  $\frac{2}{3}$ ths of an inch. The cephalo-thorax is of a brownish-black hue, with narrow, white margins. The palpi are rather long, the radial joint is smaller than the cubital, and the digital joint, which is of a short, broad, oval figure, and dark-brown colour, is convex and hairy externally, concave within, comprising the palpal organs; these organs are highly developed, not very complicated in structure, with a short, curved, prominent, pointed spine at the upper part, on the outer side, and are of a very dark-brown colour. The abdomen has a brown-black hue above, with a few white hairs at its anterior extremity; the sides are white; and the under part is of a brown colour.

Both sexes have numerous compound hairs on various parts of the body and limbs.

This active spider frequents wooded districts in England and Wales, and being provided, like other species of the genus, with scopulæ situated below the tarsal claws, it runs with great rapidity on the dry, perpendicular surfaces of highly polished bodies. Though the sexes differ so remarkably in colour when adult, yet they resemble each other in that particular before they arrive at maturity. In June the female constructs a lenticular cocoon, of white silk, of a fine but compact texture, measuring  $\frac{1}{4}$ th of an inch in diameter, in which she deposits about seventy-two spherical eggs, of a yellowish-white colour, not agglutinated together. This cocoon is enclosed in a cell of dull-white silk, of a loose texture, usually attached to a dead leaf, the edges of which are drawn towards each other by silken lines connecting them with the cell.

## PHILODROMUS PALLIDUS. Pl. V, fig. 56.

*Philodromus pallidus*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 554.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xx, p. 499.

*Artamus griseus*, Koch, Die Arachn., Band xii, p. 81, tab. 415, figs. 1013, 1014.

Length of the female,  $\frac{1}{4}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{3}{10}$ ths; length of a leg of the second pair,  $\frac{3}{8}$ ths; length of a leg of the third pair,  $\frac{1}{4}$ th.

The cephalo-thorax is convex, hairy, compressed before, truncated in front, and rounded on the sides, which are marked with furrows converging towards the middle; its colour is light-gray, intermixed with yellowish-brown and dark-brown; the latter hue forms a medial band, whose anterior extremity is ramified in the region of the eyes, and several oblique rays and spots on the sides; the margins have a yellowish-white tint, which extends, in front, to the anterior row of eyes. The falces are small, conical, vertical, and of a dark-brown hue, with a conspicuous, yellowish-white spot in front. The maxillæ are convex near the base, and inclined towards the lip, which is triangular and rounded at the apex. These parts are of a dark-brown colour, tinged with red, the lip being the darkest. The sternum is heart-shaped, and of a yellowish-brown hue. The eyes are disposed on the anterior part of the cephalo-thorax, in two transverse, curved rows, forming a crescent whose convex side is directed forwards; the lateral eyes of both rows are seated on minute tubercles, those of the posterior row being the largest, and the two intermediate ones of the anterior row the smallest of the eight. The legs are long, provided with hairs and sessile spines, and of a pale, reddish-brown colour, with black spots and annuli, a broad, black streak extending along the anterior side of the femora of the first pair; the second pair is the longest, then the first, and the fourth pair is slightly longer than the third; each tarsus is terminated by two curved, minutely pectinated claws, below which there is a small scopula. The palpi resemble the legs in colour, and have a broad, longitudinal, black streak on the anterior side of the humerus. The abdomen is broader in the posterior than in the anterior region, but is pointed at the spinners; it is hairy, somewhat convex above, and the anterior extremity, which is notched in the middle, projects over the base of the cephalo-thorax; the upper part is of a yellowish-gray colour, tinged with green, a few curved, black lines forming very obtuse angles, whose vertices are directed forwards, and whose convex sides are turned towards each other, occurring in the posterior region; the sides are mottled with black, and on each there are two oblique streaks of the same hue, bordered posteriorly with long white hairs; the under part has a yellow-brown hue, four dark-brown lines extending from the anterior extremity to the spinners, where they meet; and the colour of the branchial opereula is brown.

*Philodromus pallidus* has numerous compound hairs on various parts of its body and limbs.

According to M. Koch, the male is smaller and darker coloured than the female, but its legs are longer than hers. The prevailing colour of its palpi is yellowish, that of the digital joint being brown; and the palpal organs have a very dark, reddish-brown hue.

On the 8th of June, 1856, a living adult female of this species was received from Mr. R. H. Meade, which had been taken on the trunk of an ash tree in Kent a few days previously. This female, about the middle of June, fabricated in a box, in which it was confined, a very slight cocoon of white silk, measuring three eighths of an inch in diameter, and deposited in it numerous spherical eggs, of a pale-brown colour, not adherent among themselves.

*PHILODROMUS ELEGANS.* Pl. V, fig. 57.

*Philodromus elegans*, Blackw., Annals and Mag. of Nat. Hist., third series, vol. iii, p. 92.

Length of the female,  $\frac{3}{4}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{1}{9}$ th; length of a leg of the second pair,  $\frac{1}{2}$ ; length of a leg of the third pair,  $\frac{3}{10}$ ths.

The eyes, which are nearly equal in size, are disposed on the anterior part of the cephalo-thorax in two transverse, curved rows, forming a crescent whose convexity is directed forwards; and the lateral ones are seated on minute tubercles. The cephalo-thorax is short, broad, convex, compressed before, rounded on the sides, clothed with whitish hairs, particularly on the lateral margins, and of a pale-yellowish colour; a broad, dark-brown band extends along each side, a narrow, longitudinal one of the same hue, which is enlarged near its middle, occupies the medial line, and a short, fine, dark-brown streak occurs on each side of its anterior extremity. The falces are subconical and vertical; the maxillæ are convex near the base, obliquely truncated at the extremity, on the outer side, and inclined towards the lip, which is triangular and pointed at the apex; and the sternum is heart-shaped. These parts are of a yellowish-brown colour, with the exception of the lip, which has a dark-brown hue. The legs are long, slender, provided with hairs and spines, and of a yellow-brown hue, with red-brown annuli; the second pair is the longest, then the first, and the third pair is the shortest; the metatarsi and tarsi have hair-like papillæ on their inferior surface, and the latter are terminated by two curved, pectinated claws. The palpi are short, and resemble the legs in colour. The abdomen is oviform, clothed with short hairs, convex above, notched in the middle of the anterior extremity, and projects over the base of the cephalo-thorax; a broad, yellowish-brown band extends along the middle of the upper part, the anterior region of which comprises a dark-brown, fusiform band, having an angular point on each side, and occupying rather more than a third of its length; this band is bordered laterally with yellowish-white, and between it and the spinners there is a series of alternate, short, yellowish-white and dark-brown curved bars, whose convexity is directed forwards, a triangular spot of the latter hue, having its vertex in contact with the coccyx, terminating the series; the sides are of a

dark-brown hue, and have conspicuous, yellowish-white streaks and spots disposed obliquely upon them; the under part is of a yellowish-white colour, with minute, dark-brown spots, and three longitudinal bands of the same hue, which meet at the spinners, the intermediate one being the narrowest of the three.

Specimens of this handsome *Philodromus*, which, by its colours and the design resulting from their distribution, bears a striking resemblance to certain species of the genus *Sphasus*, were taken in September, 1858, at Lyndhurst, in the New Forest, by the Rev. O. P. Cambridge.

PHILODROMUS CESPITICOLIS. Pl. V, fig. 58.

*Philodromus cespiticolis*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 555.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. vii, p. 452.

— *cespitolens*, Blackw., Linn. Trans., vol. xix, p. 123.

— *fusco-marginatus*, Sund., Vet. Acad. Handl., 1832, p. 224.

Length of the female,  $\frac{9}{40}$ ths of an inch; length of the cephalo-thorax,  $\frac{3}{40}$ ths, breadth,  $\frac{3}{40}$ ths; breadth of the abdomen,  $\frac{1}{10}$ th; length of a leg of the second pair,  $\frac{2}{5}$ ths; length of a leg of the fourth pair,  $\frac{3}{10}$ ths.

The legs are long and of a reddish-brown colour, being darkest at the joints; the second pair is the longest, then the first, and the third pair is rather longer than the fourth; each tarsus is terminated by two curved, pectinated claws, and below them a small scopula is situated. The palpi resemble the legs in colour, and have a curved, pectinated claw at their extremity. The cephalo-thorax is short, broad, compressed before, rounded on the sides, convex and hairy; it is of a reddish-brown colour, with narrow, yellowish-white margins, and a broad band, of a pale, yellowish-brown hue, extending along the middle. The eyes are arranged on the anterior part of the cephalo-thorax in the form of a crescent, those of the lateral pairs being the largest. The falces are small, vertical, and of a pale, reddish-brown colour. The maxillæ are slender; and the lip is triangular and pointed at its apex. These parts are of a yellowish-brown hue, the lip having a dark-brown, triangular spot in the medial line. The sternum, which is heart-shaped, is of a pale, reddish-brown colour, with margins of a darker hue. The abdomen is clothed with short hairs, is broader in the middle than at the extremities, and projects a little over the base of the cephalo-thorax; it is of a yellowish-brown colour above, with a dark, reddish-brown mark, of a triangular form, in the middle of the anterior part, which has its vertex directed forwards; between this triangle and the posterior extremity of the abdomen there is a series of transverse, slightly curved lines of the same colour, diminishing in length as they approach the anus, and an oblong spot, of a brownish-black hue occurs on each side, near the spinners; the colour of the sides is dark, reddish-brown; that of the under part is yellowish-white, with three longitudinal, reddish-brown bands, which unite near the spinners, and the branchial opercula have a yellow hue.

The male is rather smaller and darker coloured than the female, and its legs are longer, a leg of the second pair measuring half an inch. The cubital and radial joints of the palpi are short; the latter projects a pointed apophysis from its extremity, on the outer side, and a shorter and more obtuse one, having two conical protuberances near its base, from the under side; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs, which are moderately developed, with a curved, spine-like process on the inner side, and are of a dark, red-brown colour.

*Philodromus cespiticolis* is found among heath, gorse, and juniper bushes, in the vicinity of woods in Lancashire, Berwickshire, and the west of Denbighshire. In July the female spins a cell of compact, white silk among leaves growing near the extremities of the stems of shrubs, curving them about it and retaining them in that position by means of silken lines. This cell she occupies, and usually constructs in it two lenticular cocoons, of white silk, of a delicate texture, depositing in each from 40 to 100 spherical eggs, of a pale-yellow colour. The cocoons frequently differ considerably in size, the larger one measuring about one fourth of an inch in diameter.

#### PHILODROMUS CLARKII.

*Philodromus Clarkii*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. vi, p. 338.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 37.

Length of the male,  $\frac{1}{7}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{16}$ th, breadth,  $\frac{1}{18}$ th; breadth of the abdomen,  $\frac{1}{16}$ th; length of a leg of the second pair,  $\frac{3}{8}$ ths; length of a leg of the fourth pair,  $\frac{1}{4}$ th.

The cephalo-thorax is short, broad, convex, slightly compressed before and rounded on the sides; the falces are small, conical, and vertical; the maxillæ are gibbous near the base; the lip is triangular; and the sternum is heart-shaped; the legs are long, slender, and provided with hairs and spines; the second pair is the longest, then the first, and the fourth pair is the shortest. These parts are of a red-brown colour, freckled with minute spots of a deeper hue. Each tarsus is terminated by two curved, pectinated claws, below which there is a small scopula. The palpi are short, and resemble the legs in colour; the radial joint is smaller than the cubital, and projects a large and somewhat pointed apophysis from its extremity, on the outer side; the digital joint is of an irregular, oval figure, being convex at the base and depressed near the middle; it is hairy externally, concave within, comprising the palpal organs, which are moderately developed and not very complicated in structure; a long, slender, black spine, prominent at its origin on the inner side, is curved round their extremity, and they are of a red-brown colour; the concavity of the digital joint does not extend to its termination, which is compact. The eyes are disposed on yellowish-white spots at the anterior part of the cephalo-thorax, in the form of a crescent, and the lateral eyes are



seated on small but distinct tubercles. The abdomen is oviform, sparingly clothed with hairs, convex above, projecting over the base of the cephalo-thorax; its colour is red-brown, freckled with minute spots of a darker hue, the sides being the palest; on the upper part, a series of oblique, not very distinct, yellowish-white spots occurs on each side of the medial line; these series are slightly curved, and, as their extremities meet, they describe an oblong, lanceolate figure.

A male of *Philodromus Clarkii*, having the palpal organs completely developed, was taken at Southgate in June, 1849, and is preserved in Mr. Walker's cabinet.

#### PHILODROMUS VARIATUS.

*Philodromus variatus*, Blackw., Lond. and Edinb. Phil. Mag., third series, vol. x, p. 102.

— — — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 37.

Length of the female,  $\frac{1}{4}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{11}$ th, breadth,  $\frac{1}{11}$ th; breadth of the abdomen,  $\frac{1}{9}$ th; length of a leg of the second pair,  $\frac{9}{34}$ ths; length of a leg of the fourth pair,  $\frac{7}{24}$ ths.

The abdomen is oviform, hairy, convex above, and projects a little over the base of the cephalo-thorax; the upper part is of a yellowish-brown hue, mingled with red-brown and very dark-brown; a band of the last colour extends from its anterior extremity, along the middle, nearly half of its length; this band is comprised between two parallel bands of a pale, yellow-brown hue, and on each side of it there are two dark-brown, circular depressions, the four describing a small quadrangular figure; about the middle, several oblique, very dark-brown patches occur, behind which there is a curved, transverse line of the same hue; a black streak passes upwards from each superior spinner, and the space between them is of a glossy, yellow-brown colour; the sides have a red-brown hue, blended with brownish-black; the under part is of a yellowish-white colour, faintly tinged with dull-green, the middle being occupied by a broad, longitudinal, dark-brown band; and the colour of the branchial opercula is dull-yellow. The cephalo-thorax is short, broad, convex, hairy, slightly compressed before, and rounded on the sides, which are of a dark-brown colour, mingled with yellow-brown, a broad band of the latter hue extending along the middle. The falces are conical, vertical, armed with one or two small teeth on the inner surface, and of a reddish-brown colour. The maxillæ are gibbous at the base, and have a yellowish-brown tint. The lip is triangular and of a dark-brown hue, being palest at the apex, which is obtuse. The sternum is heart-shaped, of a yellowish-brown colour, with reddish-brown lateral margins, and is thinly covered with whitish hairs. The legs are long, provided with hairs and sessile spines, and of a pale, reddish-brown hue, which is deepest at the joints; the second pair is the longest, then the first, and the third pair is rather longer than the fourth; each tarsus is terminated by two curved, pectinated claws, and below them there is a small scopula. The palpi resemble the

legs in colour, and have a curved, pectinated claw at their extremity. The eyes are arranged on the anterior part of the cephalo-thorax in the form of a crescent, those constituting its cusps, which are seated on small tubercles, being the largest.

In summer, when the sun shines brightly, this species may be seen on rails and gates in the neighbourhood of Llanrwst. Early in June the female constructs a lenticular cocoon of white silk, of a slight texture, measuring one third of an inch in diameter, in which she deposits about sixty-four spherical eggs of a pale-yellow colour, not agglutinated together.

#### PHILODROMUS MISTUS.

*Philodromus mistus*, Blackw., Lond. and Edinb. Phil. Mag., third series, vol. x, p. 103.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 38.

Length of the female,  $\frac{5}{24}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{12}$ th, breadth,  $\frac{1}{12}$ th; breadth of the abdomen,  $\frac{1}{10}$ th; length of a leg of the second pair,  $\frac{1}{3}$ d; length of a leg of the fourth pair,  $\frac{13}{48}$ ths.

The abdomen is oviform, hairy, convex above, and projects a little over the base of the cephalo-thorax; the upper part is of a pale, yellowish-brown colour, mottled with reddish-brown, an obscure, oblong-oval band of the latter hue extending from the anterior extremity along the middle, nearly half of its length; it is encircled by an irregular band of a dark, reddish-brown colour, from which some imperfectly defined streaks pass obliquely upwards, particularly in the posterior region; the sides and under part are of a dull, yellowish-white hue, minutely spotted with reddish-brown, three red-brown bands extending along the middle of the latter and meeting in a point near the spinners; the sexual organs are of a very dark, reddish-brown colour; and the branchial opercula have a yellowish-brown hue. The cephalo-thorax is short, broad, convex, hairy, slightly compressed before, and rounded on the sides; it is of a yellowish-brown colour, with a broad, longitudinal, dark-brown band on each side, and narrow, pale, yellowish-white margins. The falces are conical, vertical, and armed with one or two very small teeth on the inner surface; the maxillæ are enlarged where the palpi are inserted, and gibbous at the base; and the lip is triangular and rounded at the apex. These parts are of a yellowish-brown colour, the base of the lip being dark-brown. The sternum is heart-shaped, thinly covered with whitish hairs, and of a yellowish-brown hue, freckled with minute, blackish spots, which are densest on the sides. The legs are long, provided with hairs and sessile spines, and are of a pale, yellowish-brown colour, interspersed with minute, blackish spots, which are scarcely perceptible without the aid of a magnifier; the second pair is the longest, then the first, and the third pair is slightly longer than the fourth; each tarsus is terminated by two curved, deeply pectinated claws, and below them there is a small scopula. The palpi resemble the legs in colour, and have a curved, pectinated claw at their extremity. The eyes are disposed on the anterior part of the cephalo-thorax in the

form of a crescent, those constituting its cusps, which are seated on small tubercles, being the largest.

The male is smaller than the female, and its cephalo-thorax is of a dark-brown colour, with a broad band of a paler hue extending along the middle, and narrow, yellowish-white margins. The falces, maxillæ, lip, sternum, legs, and palpi are of a deep-brown colour, the digital joint of the palpi and the base of the lip being much the darkest, and the falces having a tinge of red. The radial joint of the palpi projects three apophyses from its extremity; one, situated on the under side, is short, strong, and furnished with two pointed prominences; another, which is longer and acute, occurs on the outer side; and the third, which is very small, is in front; the digital joint is somewhat oval, but prominent on the outer side; it is convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, not very complex in structure, with a fine spine curved from the inner side round their extremity, and are of a very dark, reddish-brown colour. The prevailing hue of the abdomen is dark-brown, approaching to black; on the upper part it is freckled with white, and the oblong-oval band extending along the middle of its anterior half is imperfectly defined by an obscure border of whitish hairs; the sides have a brown hue; and that of the branchial opercula is dark-brown. The hairs on the cephalo-thorax and abdomen of adult individuals of this sex reflect brilliant tints of green and purple, when viewed in a strong light.

Affecting the same localities as *Philodromus variatus*, this spider pairs in May; and in June the female spins a cell of white silk, in which she constructs a lenticular cocoon of a slight texture, measuring one fourth of an inch in diameter, and deposits in it between sixty and seventy spherical eggs of a pale-yellow colour, not agglutinated together. A near resemblance may be traced between *Philodromus mistus* and *Philodromus cespiticolis*, Walck.

#### PHILODROMUS AUREOLUS. Pl. V, fig. 59.

*Philodromus aureolus*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 556.

— — Sund., Vet. Acad. Handl., 1832, p. 223.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 38.

*Thomisus* — Hahn, Die Arachn., Band ii, p. 57, tab. 62, figs. 144, 145.

Length of the female,  $\frac{1}{4}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{11}$ th, breadth,  $\frac{1}{14}$ th; breadth of the abdomen,  $\frac{1}{4}$ th; length of a leg of the second pair,  $\frac{3}{8}$ ths; length of a posterior leg,  $\frac{3}{8}$ ds.

The eyes are disposed on the anterior part of the cephalo-thorax in the form of a crescent, those constituting each lateral pair being seated on distinct tubercles. The cephalo-thorax is broad, convex, slightly compressed before, rounded on the sides, and of a brownish-red colour, obscurely mottled with pale-yellow, a broad band of the latter hue extending along the middle. The falces are small, conical, and vertical; the maxillæ are gibbous near the

base; and the lip is triangular and rounded at the apex. These parts are of a pale-yellow colour, the base of the lip and a spot near the base of the falces, in front, having a red-brown hue. The sternum is heart-shaped, and of a brownish-red tint, mottled with pale-yellow. The legs are long, and are provided with hairs and sessile spines; they are of a pale-yellow colour, the anterior extremities of the femora and tibiæ of the first and second pairs having a brownish-red hue; the second pair is the longest, then the first, and the fourth pair is the shortest; each tarsus is terminated by two curved, pectinated claws, and below them there is a small scopula. The palpi, which are short, are of a pale-yellow colour, and have a curved, pectinated claw at their extremity. The abdomen is broader in the posterior than in the anterior region, pointed at the spinners, somewhat convex above, and projects a little over the base of the cephalo-thorax; it is of a pale-yellow colour, with a brownish-red band, which is pointed before, extending from the anterior extremity, along the middle of the upper part, more than a third of its length; and from each side of the posterior extremity of this band a series of oblique, graduated lines of the same colour extends nearly to the spinners; the sides are of a red-brown hue, marked irregularly with pale-yellow; the under part is of a pale-yellow colour, freckled with red-brown, a broad band of the latter hue extending along the middle; and the sexual organs have a reddish-brown tint.

The male is darker coloured than the female, and its abdomen is smaller; the design also on its upper part is less distinctly marked. The palpi are long; the radial is larger than the cubital joint, and projects two strong apophyses from its extremity, one situated on the outer side and the other underneath; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, with a long, fine, pointed, black spine curved from the inner side round their extremity.

Both sexes of this species, which were captured at Southgate in July, 1849, are in Mr. Walker's cabinet. Professor Sundevall states ('Vet. Acad. Handl.,' 1832, p. 224), that in July the female deposits numerous yellow eggs, not adherent among themselves, in a depressed, white cocoon, which is attached to the trunks of trees or to walls by a small, round, dense, white web.

**PHILODROMUS OBLONGUS.** Pl. V, fig. 60.

*Philodromus oblongus*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 558.

— — Blackw., Linn. Trans., vol. xix, p. 123.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 38.

— *trilineatus*, Sund., Vet. Acad. Handl., 1832, p. 227.

*Thomisus oblongus*, Latr., Gen. Crust. et Insect., tom. i, p. 112.

— — Hahn, Die Arachn., Band i, p. 110, tab. 28, fig. 82.

*Thanatus trilineatus*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 28.

Length of the female,  $\frac{3}{8}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{10}$ th;

breadth of the abdomen,  $\frac{1}{8}$ th; length of a leg of the second pair,  $\frac{7}{10}$ ths; length of a leg of the third pair,  $\frac{3}{10}$ ths.

The abdomen is of an oblong-oviform figure; it is thickly covered with short hairs, and the anterior extremity, which is slightly notched, projects a little over the base of the cephalo-thorax; it is of a yellowish-white colour, with a dark-brown band extending along the middle of the upper part, on each side of which there is a narrower parallel band of the same hue; some dark-brown spots are scattered over its surface, the most conspicuous pair being situated at about one third of its length from the anus; and a large, dark-brown band, broadest at its anterior extremity and tapering to the spinners, extends along the middle of the under part; the sexual organs are of a red-brown colour, and the branchial opercula have a pale-yellow hue. The cephalo-thorax is somewhat oval, compressed before, truncated in front, convex, and thinly covered with hairs; it is of a yellowish-white colour, with a dark-brown band extending along each lateral margin, and another of the same tint in the medial line, which is broadest at its anterior part, where it comprises a narrow, longitudinal, yellowish-white streak. The eyes are small, and are disposed on the anterior part of the cephalo-thorax in two curved, transverse rows; the posterior row is much the longer of the two, which together form a narrow crescent. The falces are conical, vertical, and armed with one or two small teeth on the inner surface; the maxillæ are inclined towards the lip, which is short, and somewhat oval; the sternum is heart-shaped; the legs are moderately long, and are provided with hairs and sessile spines; the second pair is the longest, then the fourth, and the third pair is the shortest; the palpi are short, with a curved, slightly pectinated claw at their extremity. These parts, which are of a yellowish-white hue, are spotted with small, dark-brown spots, those on the sternum being the most numerous. Each tarsus is terminated by two curved, pectinated claws, and below them there is a small scopula.

The male bears a strong resemblance to the female, but may readily be distinguished from her, when adult, by the palpal organs.

Specimens of *Philodromus oblongus* have been taken in the north of Lancashire and in Cheshire.

#### Genus SPARASSUS (*Walckenaer*).

*Eyes* disposed on the anterior part of the cephalo-thorax in two transverse rows, the posterior of which is the longer.

*Maxillæ* straight and rounded at the extremity.

*Lip* short, semicircular, or somewhat oval.

*Legs* long, robust, varying in their relative length in different species.



## SPARASSUS SMARAGDULUS. Pl. V, fig. 61.

*Sparassus smaragdulus*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 582.

— — Blackw., Linn. Trans., vol. xix, p. 123.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 38.

— *smaragdinus*, Sund., Vet. Acad. Handl., 1831, p. 147, and 1832, p. 271.

— *virescens*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 28.

— — Koch, Die Arachn., Band xii, p. 87, tab. 416, fig. 1019.

*Micrommata smaragdina*, Latr., Gen. Crust. et Insect., tom. i, p. 115.

— — Hahn, Die Arachn., Band i, p. 119, tab. 33, fig. 89.

Length of the female,  $\frac{3}{8}$ ths of an inch; length of the cephalo-thorax,  $\frac{3}{32}$ ths, breadth,  $\frac{1}{8}$ th; breadth of the abdomen,  $\frac{1}{4}$ th; length of a leg of the second pair,  $\frac{3}{8}$ ths; length of a leg of the third pair,  $\frac{3}{8}$ ths.

The eyes constitute a segment of a circle, with its convexity directed forwards; the lateral eyes of the anterior row are the largest, and the intermediate ones of the same row are the smallest of the eight. The cephalo-thorax is compressed before, rounded on the sides, convex, with slight furrows converging from the lateral margins towards the middle. The falces are powerful, conical, vertical, and armed with teeth on the inner surface. The lip is semicircular; and the sternum is heart-shaped. The legs are provided with hairs and sessile spines; the second pair is the longest, then the fourth, and the third pair is the shortest; the metatarsi and tarsi have hair-like papillæ distributed upon their inferior surface, and the latter are terminated by two curved, deeply pectinated claws, below which there is a small scopula. The palpi are robust, and have a minute, curved, pectinated claw at their extremity. The abdomen is of an oblong-oviform figure, sparingly clothed with short hairs, convex above, projecting over the base of the cephalo-thorax. The colour of this sex is green; the abdomen, which is paler than the cephalo-thorax, has a band of a deeper hue extending from the anterior extremity along the middle of the upper part, about half of its length, and terminating in a point; the sexual organs are large, glossy, with a septum in the middle, and are of a very dark, reddish-brown colour.

When immature, the male resembles the female in colour, but in the adult state it differs from her remarkably; it is smaller, and the abdomen, which is of a yellow colour above, has three bands of a fine red tint extending from its anterior to its posterior extremity, one situated in the middle and another on each side; underneath, it is of a dull-green hue. The radial joint of the palpi projects a long, pointed, red-brown apophysis from its extremity, in front; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, of a reddish-brown colour, and are terminated by a curved, pointed spine.

This handsome spider is not uncommon in the south of England, and has been captured, in an immature state, in the woods at Tan y Bwlch, in Merionethshire, by Thomas Glover, Esq., of Smedley Hill, near Manchester. The great dissimilarity of the sexes, when fully developed, has caused them to be mistaken for distinct species.

*Family* DRASSIDÆ.

The *Drassidæ* have a geographical range extending over a large portion of the earth; their falces are articulated either on an inclined plane or vertically, and their abdomen is terminated by three pairs of spinners, and has two branchial opercula on the under side. In much the greater number of species the tarsi are provided with two claws, and have numerous hair-like papillæ distributed upon their inferior surface, or forming a scopula at their extremity; but in a few instances they are furnished with three claws, and are destitute of hair-like papillæ.

The spiders of this family conceal themselves in silken cells, which they construct among the leaves of plants, in the crevices of rocks and walls, and under stones, and the exfoliating bark of aged trees; they run actively in pursuit of the insects which constitute their food, or take them by surprise; but one species, the *Argyroneta aquatica* of authors, lives habitually in the water of ditches and pools, pursuing its prey by swimming, and even constructing its dome-shaped cell and depositing its eggs beneath the surface of that liquid, being enabled to respire when immersed by the supply of air contained among the hairs which densely cover the inferior surface of its abdomen.

*Genus* DRASSUS (*Walckenaer*).

*Eyes* arranged in two transverse rows on the anterior part of the cephalo-thorax; they do not differ materially in size.

*Maxillæ* long, inclined or curved towards the lip.

*Lip* long, somewhat oval, and rounded or obtuse at the extremity.

*Legs* robust, varying in their relative length in different species.

## DRASSUS LUCIFUGUS. Pl. VI, fig. 62.

*Drassus lucifugus*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 613.

— — Sund., Vet. Acad. Handl., 1831, p. 138.

— — Koch., Uebers. des Arachn. Syst., erstes Heft, p. 18.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii,  
p. 39.

— *melanogaster*, Latr., Gen. Crust. et Insect., tom. i, p. 87.

— — Hahn, Die Arachn., Band ii, p. 11, tab. 41, fig. 102.

*Filistata femoralis*, Wider, Museum Senckenberg. Band i, p. 206, taf. 14, fig. 5.

*Pythonissa lucifuga*, Koch, Die Arachn., Band vi, p. 54, tab. 194, figs. 468—470.

Length of the female,  $\frac{1}{2}$  an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{8}$ th; breadth of the abdomen,  $\frac{1}{8}$ th; length of a posterior leg,  $\frac{1}{2}$ ; length of a leg of the third pair,  $\frac{7}{10}$ ths.

The eyes are seated on the anterior part of the cephalo-thorax in two transverse, curved, diverging rows, the posterior of which is the longer and more curved. The cephalo-thorax is oval, convex, and sparingly clothed with hairs; the falces are powerful, conical, and vertical; the maxillæ are greatly enlarged where the palpi are inserted; the lip is somewhat oval and rounded at the extremity; and the sternum is heart-shaped; the legs are robust; the posterior pair is the longest, then the first, and the third pair is the shortest. These parts are of a very dark, reddish-brown colour, the thighs and the humeral joint of the palpi being much the reddest. The abdomen is of an oblong-oviform figure, slightly depressed, rather broader at the posterior than at the anterior extremity, and projects over the base of the cephalo-thorax; it is covered with short, glossy hairs, and is black, with the exception of the branchial opercula, which are of a yellow colour; on the upper part there are six small depressions, disposed on each side of the medial line in two equal, parallel rows.

The male, when adult, is distinguished from the female by its smaller size, and by the structure of its palpi and palpal organs. The radial joint of the palpi has a large, curved, pointed apophysis at its extremity, in front; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs, which are moderately developed, and not very complicated in structure.

According to Dr. Leach (Supplement to the fourth, fifth, and sixth editions of the 'Encyclopædia Britannica,' article "Annulosa") the *Drassus melanogaster* of Latreille (*Drassus lucifugus*, Walckenaer) has been found in England, under stones; and on his authority it is introduced here as a British spider.

Since the above paragraph was written, an adult female *Drassus lucifugus*, which was taken by the Rev. O. P. Cambridge, in 1856, near Blandford in Dorsetshire, has been received from Mr. R. H. Meade.

M. Koch remarks ('Die Arachn.,' Band vi, pp. 55, 56), that in the month of June the

female constructs one or two lenticular cocoons of compact, white silk, measuring about five sixths of an inch in diameter; they are usually placed on the earth, or are attached to a stone, and contain numerous small, yellow eggs.

Among the new genera proposed by M. Koch, for the reception of certain groups into which he has separated the *Drassi*, there are several, including British species, which do not appear to possess characters sufficiently marked to warrant their adoption.

DRASSUS ATER. Pl. VI, fig. 63.

*Drassus ater*, Latr., Gen. Crust. et Insect., tom. i, p. 87.

— — Walck., Hist. Nat. des Insect. Apt., tom. i, p. 618.

— — Hahn, Die Arachn., Band ii, p. 54, tab. 61, fig. 142.

— — Blackw., Linn. Trans., vol. xix, p. 114.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 39.

*Melanophora subterranea*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 17.

— — Koch, Die Arachn., Band vi, p. 85, tab. 201, figs. 491, 492.

— *atra*, Koch, Die Arachn., Band vi, p. 88, tab. 201, fig. 493.

*Filistata* — Wider, Museum Senckenberg. Band i, p. 202, taf. 14, fig. 2.

Length of the female,  $\frac{3}{10}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{11}$ th; breadth of the abdomen,  $\frac{1}{10}$ th; length of a posterior leg,  $\frac{7}{20}$ ths; length of a leg of the third pair,  $\frac{1}{4}$ th.

The colour of this spider is brownish-black, with the exception of the tarsi, the sides of the thighs, the extremities of the maxillæ, the sexual organs, and the fangs of the falces, which have an obscure, reddish-brown tint, and the branchial opercula, which are of a dull-orange hue. The eyes are disposed in two short, transverse, parallel, nearly straight rows on the anterior part of the cephalo-thorax; the intermediate eyes of the anterior row, which is near the frontal margin, are the smallest of the eight, and are seated on a slight protuberance. The cephalo-thorax is large, oval, convex, glossy, somewhat pointed before, and thinly covered with hairs. The falces are powerful, conical, rather prominent, and are armed with a few small teeth on the inner surface. The maxillæ are strong, gibbous at the base, with an oblique, transverse furrow near the extremity, and are curved towards the lip, which is large and oval. The sternum is oval, glossy, and sparingly supplied with hairs. The legs are robust and hairy; the fourth pair is the longest, then the first, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws; and the palpi have a similar claw at their extremity. The abdomen is of an oblong-oviform figure, thickly covered with hairs, and projects a little over the base of the cephalo-thorax. The spinners are somewhat cylindrical and rather prominent, the two intermediate ones, which are small, being united at the base.

The male is rather smaller than the female, but it resembles her in colour. The cubital



and radial joints of the palpi are short; the latter is the stronger, and projects a large, black, pointed apophysis from its extremity, on the outer side; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, not very complicated in structure, with a small, pointed, corneous process near their extremity, on the outer side, and are of a dark, reddish-brown colour.

In the mountainous parts of Denbighshire and Caernarvonshire this species is of frequent occurrence under detached pieces of rock. When adult, the terminal joint of each intermediate spinner is directed downwards at right angles to its base, and the full complement of papillæ or spinning-tubes connected with the short terminal joint of each inferior spinner is eight. Six of these papillæ, which are of large dimensions, are probably used by *Drassus ater* in constructing its cocoon, the remarkably compact texture of which is best explained on the supposition that a copious supply of viscous matter, in a state of fluidity, is employed in its fabrication; and the other two, situated on the inferior surface of the spinner, at a greater distance from its extremity than the rest, are minute and almost contiguous. The large papillæ vary in number with the age of the animal; and it is a fact deserving of notice, that they are not always developed simultaneously on both spinners—four, five, or six being sometimes observed on one, when three, four, or five only are to be seen on the other; but the two minute ones are present invariably.

In May the female deposits forty or fifty white, spherical eggs, not agglutinated together, in a cocoon of a plano-convex figure, attached to the under side of stones by its plane surface; it is of a fine but very compact texture, and measures  $\frac{3}{8}$ ths of an inch in diameter. When newly constructed it is white, but becomes of a reddish hue before it is abandoned by the young, which, at that early period of their existence, have each inferior spinner provided with two large and two small papillæ. The female usually remains upon or near the cocoon, to which she is strongly attached.

Mr. J. Hardy has captured this species in Berwickshire.

#### DRASSUS PUSILLUS. Pl. VI, fig. 64.

*Melanophora pusilla*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 17.

— Koch, Die Arachn., Band vi, p. 90, tab. 202, fig. 496.

Length of the female,  $\frac{1}{3}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{12}$ th, breadth,  $\frac{1}{16}$ th; breadth of the abdomen,  $\frac{1}{12}$ th; length of a posterior leg,  $\frac{1}{4}$ th; length of a leg of the third pair,  $\frac{1}{8}$ th.

The eyes are disposed on the anterior part of the cephalo-thorax in two transverse, nearly straight rows; and the intermediate ones of the anterior row, which is situated immediately above the frontal margin, are seated on a minute tubercle, and are the smallest and darkest of the eight. The cephalo-thorax is oval, pointed before, sparingly clothed with hairs, convex, glossy, somewhat depressed on the sides, which are marked with slight furrows

converging towards a narrow indentation in the medial line; the falces are subconical and vertical; the maxillæ, which are very convex at the base, have an oblique, transverse furrow near their extremity, and are curved towards the lip, which is longer than broad, and rounded at the apex; and the sternum is heart-shaped. The abdomen is of an oblong-oviform figure, thinly clothed with short hairs, glossy, rather convex above, and projects a little over the base of the cephalo-thorax. The colour of these parts is black, with the exception of the branchial opercula and the sexual organs, the hue of the former being deep-yellow, and that of the latter dark, reddish-brown. The legs are robust, provided with hairs and sessile spines, and of a black hue, with the exception of the metatarsi and tarsi, the colour of those of the first and second pairs being brownish-yellow, and that of those of the third and fourth pairs red-brown; the fourth pair is the longest, then the first, the third pair being the shortest, and each tarsus is terminated by two curved, pectinated claws. The palpi resemble the legs in colour; and the digital joint, which has a red-brown hue, has a small, curved, pectinated claw at its extremity.

The male is smaller than the female, but it resembles her in colour. The cubital and radial joints of its palpi are short, and the latter, which is the stronger, projects a large, pointed apophysis from its extremity, on the outer side; the digital joint has a brownish-black hue; it is convex and hairy externally, concave within, and comprises the palpal organs, which are highly developed, prominent, complicated in structure, with a fine, pointed, slightly curved spine, originating near the middle of their outer side and directed downwards; these organs are of a dark, reddish-brown colour, mingled with yellowish-brown.

This species occurs among scattered fragments of rock in the woods about Hendre House. It bears a strong resemblance to *Drassus ater*, but differs from it in size, in the colour of the metatarsi, and of the digital joint of the palpi of the female, and also in the structure and colour of the palpal organs of the male. These characteristics being constant, there can be no doubt of its specific distinctness.

**DRASSUS PUMILUS.** Pl. VI, fig. 65.

*Melanophora pumila*, Koch, Die Arachn., Band vi, p. 68, tab. 197, figs. 480, 481.

Length of the female,  $\frac{3}{20}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{12}$ th, breadth,  $\frac{1}{16}$ th; breadth of the abdomen,  $\frac{1}{16}$ th; length of a posterior leg,  $\frac{1}{5}$ th; length of a leg of the third pair,  $\frac{3}{20}$ ths.

The cephalo-thorax is oval, somewhat pointed before, sparingly clothed with hairs, convex, glossy, with slight furrows on the sides, converging towards a narrow indentation in the medial line; it is of a brown colour; the region of the eyes, the narrow lateral margins, obscure, irregular lines on the sides, and an angular spot near the middle, whose vertex terminates at the medial indentation, having a brownish-black hue. The eyes are disposed on the anterior part of the cephalo-thorax in two transverse, slightly curved rows; the intermediate eyes of the posterior row, which is the less curved, are near to each other,

and those of the anterior row, which is situated immediately above the frontal margin, are the smallest and darkest of the eight. The falces are subconical and vertical; and the maxillæ, which are convex at the base, have an oblique, transverse furrow near their extremity, and are curved towards the lip. These organs are of a yellowish-brown colour, the falces having a tinge of red. The lip is longer than broad, and rounded at the apex; and the sternum is oval and glossy. These parts have a dark-brown hue, the lip being rather the paler. The legs are robust, and provided with hairs and sessile spines; the fourth pair is the longest, then the first, the third pair being the shortest, and each tarsus is terminated by two curved, pectinated claws; the colour of the coxæ and femora is yellow, the extremity of the latter, with the genual joint and tibia of the first and second pairs, having a brown-black, and those of the third and fourth pairs a dark-brown hue, and the colour of the metatarsi and tarsi of all the legs is red-brown. The palpi are short, and of a yellow-brown colour, with the exception of the radial and digital joints, which have a brown hue. The abdomen is oviform, somewhat depressed, and projects a little over the base of the cephalo-thorax; it is thickly covered with hairs, those at its anterior extremity being the longest, and is of a dull-black hue; the colour of the branchial opercula is deep-yellow, and that of the sexual organs reddish-brown.

According to M. Koch, the male has the cephalo-thorax, falces, sternum, and the genual and tibial joints of the first and second pairs of legs of a black hue. The cubital and radial joints of its palpi, which have a brownish-rust colour, are short, and the latter, which is the stronger, has a tooth-like prolongation on its side; the palpal organs have a black hue, and are provided with a small, brownish hook.

The Rev. O. P. Cambridge took an adult female of this small *Drassus* among the sand-hills at Southport, in June, 1859.

#### DRASSUS CLAVATOR. Pl. VI, fig. 66.

*Drassus clavator*, Cambridge, Annals and Mag. of Nat. Hist., third series, vol. v, p. 171.

Length of the male,  $\frac{1}{4}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{1}{12}$ th; length of a posterior leg,  $\frac{7}{20}$ ths; length of a leg of the third pair,  $\frac{1}{4}$ th.

The eyes, which are nearly equal in size and pellucid, are disposed on the anterior part of the cephalo-thorax in two curved, concentric, transverse rows, whose convexity is directed backwards; the four intermediate eyes form a square, the two posterior ones, which are oval and very near to each other, being rather the largest of the eight, and each lateral eye of the posterior row is seated on a small tubercle. The cephalo-thorax is oval, convex, glossy, thinly clothed with hairs, and marked on the sides with slight furrows converging towards a narrow indentation in the medial line; it is of a pale, yellowish-brown colour, veined with

soot-coloured lines, and has narrow, black, lateral margins. The falces are powerful, conical, and rather prominent; the maxillæ are convex at the base, obliquely depressed in the middle, enlarged at the extremity, and curved towards the lip, which is oval; and the sternum is broad, glossy, and heart-shaped, with small eminences on the sides, opposite to the legs. These parts are of a brown colour, the lip and margins of the sternum being the darkest, and the maxillæ, which are slightly tinged with yellow, being much the palest. The legs are robust, provided with hairs, sessile spines, and hair-like papillæ on the inferior surface of the tarsi, and have a pale, yellow-brown hue; the fourth pair is the longest, then the first, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws. The palpi resemble the legs in colour, with the exception of the radial and digital joints, which have a brown hue; the humeral joint is curved towards the cephalo-thorax; the radial joint projects from its extremity, towards the outer side, a strong apophysis, whose enlarged and depressed termination applies to the superior surface of the digital joint. This last joint is oval, convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, moderately complex in structure, with a depressed, slightly curved process towards the inner side, which is directed downwards, and are of a red-brown colour. The abdomen is oviform, convex above, and projects a little over the base of the cephalo-thorax; it is of a brownish-black colour, but is clothed with glossy, reddish hairs, and has some long, black hairs at its anterior extremity; on each side of the medial line of the anterior region of the upper part there are three minute, pale spots, disposed in pairs; to these spots succeeds a series of curved, transverse lines of the same hue, which have their convexity directed forwards, and diminish in extent as they approach the spinners; a faint, longitudinal, whitish line occurs on each side of the middle of the under part, and the branchial opercula and spinners have a pale, yellow-brown hue. The light-coloured spots and lines are little conspicuous except when the spider is submerged in spirit, and then the colour and lustre of the reddish hairs disappear.

An adult female of this species has not yet been discovered; individuals which, judging from their dimensions, must nearly have arrived at maturity, differ from the male in colour solely in being paler.

Specimens of *Drassus clavator* were received from the Rev. O. P. Cambridge, who took an adult male on the sand-hills at Southport, in the spring of 1859, and immature females under stones in Portland, in the autumn of the same year.

## DRASSUS SERICEUS. Pl. VI, fig. 67.

*Drassus sericeus*, Sund., Vet. Acad. Handl., 1831, p. 136.

— — Walck., Hist. Nat. des Insect. Apt., tom. i, p. 619.

— — Koch, Die Arachn., Band vi, p. 37, tab. 190, figs. 457, 458.

— — Blackw., Linn. Trans., vol. xix, p. 113.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 40.

*Filistata sericea*, Wider, Museum Senckenberg. Band i, p. 204, taf. 14, fig. 3.

Length of the female,  $\frac{5}{16}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{8}$ th; breadth of the abdomen,  $\frac{1}{8}$ th; length of a posterior leg,  $\frac{1}{2}$ ; length of a leg of the third pair,  $\frac{9}{32}$ ths.

The eyes are disposed on the anterior part of the cephalo-thorax in two transverse, nearly parallel rows, the intermediate ones of the anterior row, which is the shorter, being the largest of the eight. The cephalo-thorax is oval, convex, pointed before, and covered with short, silky hairs of a lightish hue, interspersed with long, upright, black ones. The falces are strong, conical, rather prominent, and armed with a few small teeth on the inner surface; the maxillæ are powerful, convex at the base and on the outer side, depressed on the inner side, with an oblique, transverse groove near the extremity; the lip is long, oval, and rounded at the apex; the sternum, which is glossy, is of an oblong-oval form, narrower at the anterior than at the posterior extremity, and has slight eminences on the sides, opposite to the legs; the legs are robust, and are provided with hairs and sessile spines; the posterior pair is the longest, and the third pair is the shortest, the first and second pairs being equal in length, or very nearly so; each tarsus has hair-like papillæ distributed on its inferior surface, and is terminated by two curved, deeply pectinated claws; the palpi are strong, and have a curved, pectinated claw at their extremity. These parts are of a reddish-brown colour, the falces, maxillæ, and lip being the darkest. The abdomen is oviform, somewhat depressed, broader at the posterior than at the anterior extremity, and is thickly covered with short, silky, black hairs; on the upper part there are four small depressions forming a quadrilateral figure, and at the anterior extremity, where it touches the cephalo-thorax, there is a tuft of long, black hairs; the under part is tinged with brown, and has a fine, indented, longitudinal line on each side of the middle; the spinners are nearly cylindrical, prominent, and of a pale-brown colour, the intermediate pair being united at the base; and the branchial opercula have a yellow hue.

The male resembles the female in colour, but it is smaller, and the first pair of legs is rather longer than the second pair. The cubital and radial joints of the palpi are short, the latter projecting a strong, pointed apophysis from its extremity, on the outer side; the digital joint is of an oblong-oval form, convex and hairy externally, concave within, comprising the palpal organs, which are moderately developed, and not very complicated in structure; they



are prominent and convex at the upper part, somewhat pointed at the extremity, and of a reddish-brown colour.

*Drassus sericeus* has been obtained in several of the northern counties of England and Wales. It frequents the interior of houses, especially such as are old, and is decidedly nocturnal in its habits. Like other species of the genus, it is enabled to run with facility on the perpendicular surfaces of dry, polished bodies by the emission of an adhesive secretion from the hair-like papillæ on the inferior surface of its tarsi. The papillæ connected with the terminal joint of each inferior spinner not only vary in number with the age of the spider, the full complement being nine large and two small ones, but a like number does not constantly occur on both spinners of the same individual.

#### DRASSUS RETICULATUS.

*Drassus reticulatus*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. x, p. 97.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xi, p. 115.

Length of the female,  $\frac{3}{8}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{6}$ th, breadth,  $\frac{1}{8}$ th; breadth of the abdomen,  $\frac{1}{7}$ th; length of a posterior leg,  $\frac{5}{12}$ ths; length of a leg of the third pair,  $\frac{5}{16}$ ths.

The eyes are round, and are disposed on the anterior part of the cephalo-thorax in two nearly parallel, transverse rows; the posterior row is rather the longer; and the intermediate eyes, which are the smallest, and nearer to each other than they are to the lateral eyes of the same row, form a square with the intermediate eyes of the anterior row, which are much the largest of the eight, and black, all the others being diaphanous. The cephalo-thorax is oval, convex, pointed before, and thinly covered with hairs; the maxillæ are long, convex at the base, depressed near the middle, enlarged at the extremity, which is obliquely truncated on the inner side, and curved towards the lip, which is long, oval, and rounded at the apex; the sternum is oval, broader in the posterior than in the anterior region, and supplied with hairs, which are densest on the margins; the legs are robust, moderately hairy, and provided with a few sessile spines; the fourth pair is the longest, the first slightly surpasses the second, and the third pair is the shortest; each tarsus has hair-like papillæ on the under side, and two curved, pectinated claws at its extremity. These parts, with the palpi, are of a yellowish-brown colour, the digital joint of the latter and the lip being the darkest. The falces are powerful, conical, armed with one or two very minute teeth on the inner surface, slightly prominent, and of a red-brown hue. The abdomen is of an elongated oviform figure, projecting a little over the base of the cephalo-thorax; it is sparingly clothed with short, whitish hairs, and is of a pale, olive-brown colour, reticulated with fine, dull, yellowish-white

lines; the sexual organs are minute, and have a reddish-brown tint; and the spinners are prominent, cylindrical, and of a pale, yellowish-brown colour.

This spider was captured by Mr. Walker, near Lancaster, in August, 1850.

DRASSUS SYLVESTRIS. Pl. VI, fig. 68.

*Drassus sylvestris*, Blackw., Lond. and Edinb. Phil. Mag., third series, vol. iii, p. 440.

— — Blackw., Research. in Zool., p. 342.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 40.

— *signifer*, Koch, Die Arachn., Band vi, p. 31, tab. 188, fig. 452.

Length of the female,  $\frac{3}{8}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{3}{10}$ ths; breadth of the abdomen,  $\frac{1}{8}$ th; length of a posterior leg,  $\frac{3}{10}$ ths; length of a leg of the third pair,  $\frac{7}{10}$ ths.

The eyes are arranged on the anterior part of the cephalo-thorax in two transverse, parallel, slightly curved rows, having their convexity directed backwards; the intermediate eyes of the posterior row, which is rather the longer, are oval, nearer to each other than they are to the lateral eyes of the same row, and form a quadrangle with the intermediate eyes of the anterior row, which are the smallest of the eight. The cephalo-thorax is oval, glossy, convex, somewhat depressed in front, where the eyes are situated, and marked with slight furrows on the sides; the falces are powerful, conical, prominent at the base, armed with teeth on the inner surface, and project a little forwards; the maxillæ are long, convex at the base, enlarged where the palpi are inserted, and at the extremity, which is obliquely truncated on the inner side; they are depressed and contracted in the middle, and curved towards the lip, which is long, oval, convex at the base, and rounded at the apex; the sternum is oval, somewhat pointed at its posterior extremity, and has minute eminences on the sides, opposite to the legs; the legs are robust, moderately hairy, and are supplied with a few small, sessile spines; the fourth pair is the longest, then the first, and the third pair is the shortest; each tarsus has hair-like papillæ on its inferior surface, and two curved claws at its extremity, which are pectinated at their base; the palpi are strong, and are terminated by a single curved claw pectinated at its base. These parts are of a reddish-brown colour, the falces, maxillæ, and lip being much the darkest. The abdomen is of an oblong-oviform figure, thickly covered with short hairs, and of a dull, olive-green colour, tinged with brown; a band of a deeper hue, broad before and tapering to a point behind, extends from its anterior extremity, contiguous to the cephalo-thorax, nearly two thirds of its length, along the middle, the interval comprised between it and the spinners being occupied by a series of obscure, hoary, angular lines, having their vertices directed forwards; the spinners are prominent, cylindrical, and have a reddish-brown tint; the sexual organs are semicircular, and of a dark, reddish-brown colour, approaching to black; and the branchial opercula are large, and have a yellow hue.

The sexes are similar in colour, but the male is smaller than the female, and the relative

length of its legs is different, the first and fourth pairs being equal in longitudinal extent. The cubital and radial joints of the palpi are short; the latter is terminated by two apophyses, one, which is situated on the inner side, is short and broad, and the other, which is long and compressed at its extremity, overlaps the base of the digital joint, in front; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs; they are highly developed, complicated in structure, with several strong, curved, pointed processes at their extremity, and are of a dark, red-brown colour.

M. Walckenaer has placed the *Drassus signifer* of M. Koch, which is specifically identical with *Drassus sylvestris*, among the synonyma of *Clubiona (Drassus) lapidicolens*, supposing it to be that species in an immature state ('Hist. Nat. des Insect. Apt.,' tom. ii, p. 479). Now as adults of both sexes, taken in the woods about Llanrwst, are invariably much smaller than *Clubiona (Drassus) lapidicolens*, and also differ from it materially in colour and in structure, having the maxillæ more curved towards the lip, and all the essential characters of a *Drassus* more highly developed, the name first conferred upon this distinct species is retained.

In July the female construts a lenticular cocoon of white silk, of a fine but compact texture, measuring three tenths of an inch in diameter, which she places in a cavity formed in the earth beneath stones, and lined with silk, depositing in it about 123 whitish eggs of a spherical form, not agglutinated together. She is greatly attached to her cocoon, and is with difficulty compelled to abandon it.

A specimen of this spider was captured in Berwickshire by Mr. Hardy, in the spring of 1849.

#### DRASSUS CUPREUS. Pl. VI, fig. 69.

*Drassus cupreus*, Blackw., Research. in Zool., p. 345.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 41.

— *rufus*, Koch, Die Arachn., Band vi, p. 33, tab. 189, figs. 453, 454.

Length of the female,  $\frac{2}{5}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{5}$ th, breadth,  $\frac{1}{8}$ th; breadth of the abdomen,  $\frac{1}{8}$ th; length of a posterior leg,  $\frac{1}{2}$ ; length of a leg of the third pair,  $\frac{2}{3}$ ths.

The cephalo-thorax is oval, convex, sparingly covered with short, fine hairs, and marked with slight furrows on the sides; the falces are powerful, conical, rather prominent, and armed with a few teeth on the inner surface; the maxillæ are long, convex at the base, enlarged where the palpi are inserted, and at the extremity, which is obliquely truncated on the inner side; they are depressed and contracted in the middle, and are curved towards the lip, which is longer than broad, and truncated at the apex; the sternum is oval, and has small eminences on its sides, opposite to the legs; the legs are robust, moderately hairy, and provided with a few sessile spines; the fourth pair is the longest, then the first, and the third pair is the shortest; each tarsus has hair-like papillæ on the under side, and is terminated by two curved,

pectinated claws; the palpi have a single curved, pectinated claw at their extremity. These parts are of a pale, reddish-brown colour, the margins of the cephalo-thorax, sternum, and lip having a blackish tint. The eyes are disposed on the anterior part of the cephalo-thorax in two transverse, somewhat curved rows, having their convexity directed backwards; the posterior row is rather the longer, and the intermediate eyes, which are oval and nearer to each other than they are to the lateral eyes of the same row, form a quadrangle with the intermediate eyes of the anterior row. The abdomen is of an oblong-oviform figure, densely covered with short hairs of a bright, reddish-copper colour, the under part being the palest; at its anterior extremity, contiguous to the cephalo-thorax, there is a tuft of long, deep-black hairs, from which a band of a blackish hue, broad before and tapering to a point behind, extends along the middle of the upper part rather more than half its length; the spinners are prominent and cylindrical, the inferior pair being the most conspicuous when in a state of repose; and the branchial opercula are large and of a pale-yellow colour. The dark band on the upper part of the abdomen is not perceptible in some individuals, and the abdomen of the female, after the completion of her parental functions, frequently assumes a grayish-brown hue.

The sexes closely resemble each other in colour, but the male is smaller than the female; its falces are longer, more prominent, and less powerful, and the relative length of its legs is different, the first pair being rather longer than the fourth. The radial joint of the palpi is longer than the cubital, and projects two pointed, corneous apophyses from its extremity, one on the outer side, and the other, which is very minute, underneath; the digital joint is of an oblong-oval form, convex and hairy externally, with a cavity on the under side, at the base, containing the palpal organs, which are neither highly developed nor very complex in structure, having a small, dark protuberance near their extremity, towards the outer side, and a fine, pointed spine, directed downwards, opposite to it, on the inner side; their colour is red-brown.

Though the *Drassus rufus* of M. Koch, identical with *Drassus cupreus*, is regarded by Walckenaer as a variety of *Clubiona livida* ('Hist. Nat. des Insect. Apt.,' tom: ii, p. 479), yet it possesses all the characteristics of a *Drassus* in so marked a degree that it might be selected as a type of the genus; consequently, the name originally given to it is retained.

As regards the papillæ connected with the inferior spinners of this species, which occurs under stones in various parts of Great Britain and Ireland, the same law of development holds good to which attention has been directed in treating upon *Drassus ater* and *Drassus sericeus*; moreover, the number of papillæ is not uniformly the same even in adults of any of these spiders, but the two minute ones belonging to each spinner are always present.

In June the female constructs a lenticular cocoon of white silk, of a fine but compact texture, measuring two fifths of an inch in diameter, in which she deposits about 118 spherical eggs, of a pale-yellow colour, not agglutinated together. The cocoon is enveloped in a large sac of very fine, white silk, usually placed in a cavity of the earth underneath a stone, and this sac generally comprises the female.

## DRASSUS LAPIDICOLENS. Pl. VI, fig. 70.

*Drassus lapidicolens*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. xiv, p. 30.

— *lapidicola*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 18.

— — Koch, Die Arachn., Band vi, p. 28, tab. 188 (misnumbered 187 in the text), figs. 450, 451.

*Clubiona lapidicolens*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 598.

— — Walck., Hist. Nat. des Insect. Apt., tom. ii, p. 479.

— *lapidicola*, Latr., Gen. Crust. et Insect., tom. i, p. 91.

— — Sund., Vet. Acad. Handl., 1831, p. 139.

— — Hahn, Die Arachn., Band ii, p. 9, tab. 40, fig. 100.

Length of the male,  $\frac{5}{16}$ ths of an inch; length of the cephalo-thorax,  $\frac{3}{16}$ ths, breadth,  $\frac{1}{7}$ th; breadth of the abdomen,  $\frac{1}{8}$ th; length of a posterior leg,  $\frac{7}{16}$ ths; length of a leg of the third pair,  $\frac{5}{12}$ ths.

The cephalo-thorax is large, convex, glossy, sparingly clothed with short hairs, compressed before, truncated in front, rounded and somewhat depressed on the sides, and has a narrow indentation in the medial line; the falces are long, subconical, prominent, with a tooth-like process near the extremity, on the inner side; the maxillæ are powerful, convex at the base, enlarged at the extremity, which is obliquely truncated and fringed with long hairs on the inner side, and have a large, transverse, oblique furrow near the middle; they are somewhat curved towards the lip, which is longer than broad, and rounded at the apex; the sternum is oval, with small eminences on the sides, opposite to the legs; the legs are long, robust, provided with hairs and sessile spines, and the metatarsi and tarsi of the first and second pairs and the tarsi of the third and fourth pairs have hair-like papillæ distributed over their inferior surface; the fourth pair is slightly longer than the first, which surpasses the second, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws, and below them there is a small scopula; the palpi are long, and the radial joint, which is longer than the cubital, has a small, black, pointed apophysis at its extremity, in front, towards the outer side; the digital joint is of a narrow, elongated-oval form, hairy and slightly convex above, compact and pointed at the extremity, and concave near the base, on the under side; this concavity comprises the palpal organs, which are small, not complex in structure, with a fine, curved, pointed, black spine, directed downwards, and a minute process of the same hue near their extremity. These parts are of a red colour, the legs being the palest, and the falces, maxillæ, lip, anterior part and lateral margins of the cephalo-thorax, and the lateral margins of the sternum, which are strongly tinged with brown, much the darkest. The eyes are disposed in two transverse, slightly curved rows on the anterior part of the cephalo-thorax, and are seated on black spots; the posterior row is the longer, and the two intermediate eyes, which have an oval form, and are nearer to each other than they are to the lateral eyes of the same row, describe with the intermediate eyes of the anterior row, which is situated



immediately above the frontal margin, a regular quadrangle; the lateral eyes of the posterior row are the smallest, and the intermediate ones of the anterior row the largest and darkest of the eight. The abdomen is of an elongated-oviform figure, broader in the middle than at the extremities, rather convex above, and projects a little over the base of the cephalo-thorax; it is hairy, and of a grayish-brown colour, an obscure band of a deeper shade extending from its anterior extremity, where there are some long black hairs, along the medial line halfway towards the spinners, and terminating in a point; the branchial opercula have a yellow hue, and that of the spinners is yellowish-brown.

The female is larger than the male, measuring seven twelfths of an inch in length, but its legs are shorter, and its falces much less prominent than his. In colour the sexes closely resemble each other.

M. Walckenaer states that the female deposits about seventy eggs, not adherent among themselves, in a subglobose cocoon of fine, compact, white silk, measuring five lines and a half in diameter; this cocoon is inclosed in a silken sac, which frequently comprises the female also; it is usually attached to the under side of a stone, and has withered leaves distributed over its exterior surface.

An adult male of this species, which was first recorded as British by Dr. Leach (see the Supplement to the fourth, fifth, and sixth editions of the 'Encyclopædia Britannica,' article "Annulosa"), has been received from the Rev. Hamlet Clark. An examination of this specimen, which was found near Northampton, in the autumn of 1853, and had recently changed its integument, has induced the conviction that M. Koch has assigned to this spider its appropriate situation in a systematic arrangement of the *Araneidea* by transferring it from the genus *Clubiona* to that of *Drassus*, as by the figure and disposition of its eyes and the structure of its oral apparatus it evidently appertains to the latter genus.

#### DRASSUS FERRUGINEUS. Pl. VI, fig. 71.

*Drassus ferrugineus*, Templeton, MS. History of Irish Arachnida.

Length of the female,  $\frac{11}{24}$ ths of an inch.

The legs are robust, hairy, and of a ferruginous colour; the first and fourth pairs are the longest and equal in length, and the third pair is the shortest. The cephalo-thorax is oval, narrow and deep anteriorly, rounded posteriorly, and of a dark ferruginous hue both above and underneath. The abdomen is ovate, elongate, or somewhat cylindrical, and cream-coloured; a narrow spear-shaped macula occupying the medial line at the base of the upper part, and having three impressed dots on each side of it.

This spider was discovered by Miss MacGee in a crevice of a wall in Belfast. By the structure of its oral apparatus it appertains to the genus *Drassus*, but by the form and disposition of its eyes it makes a near approximation to the genus *Clubiona*.

## DRASSUS MICANS. Pl. VI, fig. 72.

*Drassus micans*, Blackw., Annals and Mag. of Nat. Hist., third series, vol. i, p. 430.

Length of the male,  $\frac{1}{8}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{16}$ th, breadth,  $\frac{1}{24}$ th; breadth of the abdomen,  $\frac{1}{24}$ th; length of a posterior leg,  $\frac{1}{6}$ th; length of a leg of the third pair,  $\frac{1}{9}$ th.

The cephalo-thorax is oval, slightly compressed before, somewhat rounded in front, convex, glossy, with slight furrows on the sides converging towards a narrow indentation in the medial line; it is thinly clothed with short, hoary hairs, which are most abundant on the anterior part, and has three oblique rows of white hairs on each side, which converge towards its middle; the falces are conical, vertical, with a slight protuberance near the base, in front, towards the inner side, and have two very minute teeth on the inner surface; the maxillæ are powerful, enlarged where the palpi are inserted, gibbous at the base, depressed transversely near the middle, rounded at the extremity, with a small, angular projection on the outer side, and inclined towards the lip, which is longer than broad, and rounded at the apex; the sternum is oval, pointed at its posterior extremity, convex, and glossy. These parts are of a red-brown colour, the sternum having obscure, dark-brown streaks directed from the lateral margins towards its centre. The eyes are disposed on the anterior part of the cephalo-thorax in two short, transverse, curved, concentric rows, whose convexity is directed backwards; the interval between the intermediate eyes of the posterior row is greater than the space which separates them from the lateral ones of the same row, and the intermediate eyes of the anterior row are rather the smallest and darkest of the eight. The legs are moderately long, provided with hairs, and are of a brownish-yellow colour, with the exception of the femora of the first and second pairs, which have a brownish-black hue, and the anterior side of the femora of the third and fourth pairs, which has a brown tint; the fourth pair is the longest, then the first, and the third pair is the shortest; each tarsus is terminated by two plain, curved claws, below which there is a small scopula. The palpi are slender, and, with the exception of the humeral joint, which is of a brownish-black hue, have a brownish-yellow colour, faintly tinged with red; the cubital and radial joints are short, and the latter, which is the larger, projects a small, pointed apophysis from its extremity, on the outer side; the digital joint is of an oblong-oval form, compact and pointed at the extremity, convex and hairy externally, concave within, comprising the palpal organs, which are well developed, prominent, not very complex in structure, with a process near the middle which is directed forwards, and are of a mingled red-brown and brownish-yellow colour. The abdomen is oviform, glossy, clothed with short hairs, convex above, and projects a little over the base of the cephalo-thorax; it is of a deep-black hue, but iridescent, reflecting bright tints of green, purple, and copper when viewed in a strong light; the branchial opercula and the medial line of the under part are of a brown colour, and the extremities of the superior and inferior spinners have a somewhat darker shade; there is also a curved, transverse line immediately below the branchial opercula, and a small spot just above the spinners, which are composed of white hairs.

An adult male of this minute *Drassus* was found in Dorsetshire by the Rev. O. P. Cambridge, in the autumn of 1857.

DRASSUS NITENS. Pl. VI, fig. 73.

*Drassus nitens*, Blackw., Lond. and Edinb. Phil. Mag., third series, vol. iii, p. 439.

— — Blackw., Research. in Zool., p. 328.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 42.

— *formosus*, Walck., Hist. Nat. des Insect. Apt., tom. ii, p. 488.

*Macaria formosa*, Koch, Die Arachn., Band vi, p. 97, tab. 203, fig. 501.

Length of the female,  $\frac{1}{5}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{14}$ th, breadth,  $\frac{1}{20}$ th; breadth of the abdomen,  $\frac{1}{14}$ th; length of a posterior leg,  $\frac{1}{5}$ th; length of a leg of the third pair,  $\frac{1}{7}$ th.

The eyes are disposed on the anterior part of the cephalo-thorax in two transverse, curved, concentric rows, having their convexity directed backwards; the interval between the intermediate eyes of the posterior row is greater than the space which separates them from the lateral eyes of the same row, and the intermediate eyes of the anterior row are the smallest of the eight. The cephalo-thorax is oval, convex, somewhat rounded in front, and thinly covered with short, hoary hairs, which are most abundant on the anterior part; it is of a brownish-black colour, with three faint white lines on each side converging from the lateral margins towards the middle. The falces are strong, conical, vertical, and armed with a few very minute teeth on the inner surface; the maxillæ are powerful, enlarged where the palpi are inserted, gibbous at the base, compressed near the middle, slightly enlarged and rounded at the extremity, and inclined towards the lip, which is longer than broad and round at the apex; the sternum is of an oblong-oval form, pointed at its posterior extremity. These parts are of a brown-black colour, the sternum being the darkest. The legs are moderately long, and the thighs of the anterior pair are robust; they are of a brown colour, faintly tinged with red, except the coxæ, exinguinal joints, and thighs of the first pair, and the exinguinal joints and thighs of the second pair, which are of a dark, brownish-black hue; the fourth pair is the longest, and the third pair is the shortest; each tarsus has hair-like papillæ on its under side, and is terminated by two plain, curved claws, below which there is a small scopula. The palpi are filiform; the axillary and humeral joints have a dark, brownish-black tint, and the cubital, radial, and digital joints are of a brown colour, tinged with red. The abdomen is of an oblong-oviform figure, and projects a little over the base of the cephalo-thorax; it is covered with short hairs, and is of a deep-black hue, but reflects rich tints of purple, green, and copper-red when seen in a strong light; on the upper part, in front, there is a small, transverse, slightly curved, white line, whose convexity is directed forwards; and at a considerable distance behind it there is a long, transverse, white line, which is abruptly curved in the middle in a direction opposed to that of the preceding one; a detached white spot occurs on each side, nearly opposite to the extremities of the longer line, and a short, white streak

extends obliquely above the outer margin of the branchial opercula ; along the middle of the upper part there is a row of small, white spots, the one immediately above the spinners, which terminates the series, being the most conspicuous ; the spinners are cylindrical and rather prominent. Some slight modifications of form and size may be perceived, occasionally, in the white lines and spots, so remarkable on this species.

The male is smaller than the female, but it resembles her in colour. The cubital and radial joints of its palpi are short, the latter projecting a small, pointed apophysis from its extremity, on the outer side ; the digital joint is of an oblong-oval form, somewhat pointed at the end ; it is convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, with a small, prominent, curved spine underneath, and are of a red-brown colour.

In warm sunny weather in spring and summer this small but brilliant spider may be seen running on the ground in the woods of Denbighshire, Caernarvonshire, and Berwickshire. Like many other species of *Araneidea*, it is partial to moisture, and drinks water freely. A pair confined in a phial having become feeble and greatly emaciated, they were supplied with a few drops of water, which they drank with avidity, and speedily resumed their strength and former plump appearance. In the month of May, 1833, females, in a state of captivity, constructed cocoons of a hemispherical form, measuring about one sixth of an inch in diameter, in each of which they deposited nine or ten spherical eggs of a pale-yellow colour, not agglutinated together. The cocoons were composed of delicately white silk, of a very fine but compact texture ; and connected with the upper part of each was a tube of the same material, usually occupied by the female.

DRASSUS PROPINQUUS. Pl. VI, fig. 74.

*Drassus propinquus*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. xiii, p. 175.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xiv, p. 30.

Length of the male,  $\frac{1}{9}$ th of an inch ; length of the cephalo-thorax,  $\frac{1}{16}$ th, breadth,  $\frac{1}{24}$ th ; breadth of the abdomen,  $\frac{1}{24}$ th ; length of a posterior leg,  $\frac{1}{6}$ th ; length of a leg of the third pair,  $\frac{1}{8}$ th.

The legs are long, slender, provided with hairs and sessile spines, and of a yellowish-brown colour, with the exception of the femora of the first and second pairs, which have a dark-brown hue, those of the second pair being the paler ; the fourth pair is rather longer than the first, which surpasses the second, and the third pair is the shortest ; each tarsus is terminated by two plain, curved claws, below which there is a small scopula. The palpi are robust ; the humeral and cubital joints are somewhat darker coloured than the legs, and the radial and digital joints have a dark-brown hue ; the humeral joint has a gibbosity near its extremity, on the under side, which is provided with short hairs ; and the radial joint projects

forwards, from its outer side, a very large, curved apophysis, whose yellowish-brown extremity is slightly bifid; the digital joint is of an elongated oval form, convex and hairy externally, concave within, comprising the palpal organs; these organs are highly developed, very protuberant at the base, which is convex and glossy, and have a small, prominent process at their extremity; they are of a dark-brown colour, faintly tinged with red. The eyes are disposed on the anterior part of the cephalo-thorax in two short, transverse, slightly curved, concentric rows, whose convexity is directed backwards, the intermediate ones of the anterior row being rather the smallest and darkest of the eight. The cephalo-thorax is oval, convex, glossy, with slight furrows on the sides converging towards a narrow indentation in the medial line; it is sparingly clothed with hoary hairs, some of which are disposed in three faint rows on each side, along the furrows; the falces are conical, vertical, and armed with a few minute teeth on the inner surface; the maxillæ are powerful, enlarged where the palpi are inserted, greatly dilated at the base, rounded at the extremity, and inclined towards the lip, which is longer than broad and rounded at the apex; the sternum is heart-shaped. These parts are of a brown colour; the margins of the cephalo-thorax, and the base of the lip being much the darkest. The abdomen is oviform, glossy, thinly clothed with short hairs, convex above, projecting a little over the base of the cephalo-thorax, and is of a dark-brown colour, the under part being the palest; there is a spot on each side of the anterior extremity, a fine line extending thence along the middle of the upper part, nearly half of its length, and an oblique, transverse, curved line, whose extremities pass along the sides to the under part, and whose middle portion, abruptly curved forwards, is bisected by the point of the fine medial line; these marks are somewhat obscure, of a deep, yellowish-brown hue, and are sparingly covered with hoary hairs; a few white hairs form a minute spot immediately above the spinners, and the colour of the branchial opercula is brown.

Two adult males of *Drassus propinquus*, which is closely allied to *Drassus nitens*, were captured in the spring of 1853; one running on a public road near Llanrwst, and the other in a window of the sitting-room at Oakland. In the summer of the same year Mr. R. H. Meade took an adult male of this species in Norfolk.

*Genus* CLUBIONA (*Latreille*).

*Eyes* disposed on the anterior part of the cephalo-thorax in two transverse rows; they do not differ greatly in size.

*Maxillæ* long, straight, and enlarged at the extremity.

*Lip* long and somewhat oval, or truncated at the extremity, and nearly quadrangular.

*Legs* robust, varying in their relative length in different species.



## CLUBIONA HOLOSERICEA. Pl. VII, fig. 75.

*Clubiona holosericea*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 590.

— — Latr., Gen. Crust. et Insect., tom. i, p. 91.

— — Sund., Vet. Acad. Handl., 1831, p. 142.

— — Hahn, Die Arachn., Band i, p. 112, tab. 29, fig. 84.

— — Koch, Uebers. des Arachn. Syst., erstes Heft, p. 19.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 42.

Length of the female,  $\frac{5}{12}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{6}$ th, breadth,  $\frac{1}{8}$ th; breadth of the abdomen,  $\frac{2}{30}$ ths; length of a posterior leg,  $\frac{1}{2}$ ; length of a leg of the third pair,  $\frac{3}{8}$ ths.

The eyes form two transverse rows on the anterior part of the cephalo-thorax; the posterior row is the longer, and the interval between the intermediate eyes is greater than the space which separates them from the lateral ones of the same row; the anterior row is situated very near to the frontal margin, and the intermediate eyes are the largest of the eight. The cephalo-thorax is somewhat oval, convex, broadly rounded in front, thinly covered with short, silky, grayish hairs, and is of a pale, greenish-brown colour, obscurely veined with black; the anterior part is the brownest, and the lateral margins are black. The falces are strong, prominent, subconical, and armed with teeth on the inner surface; the maxillæ are long, straight, powerful, enlarged where the palpi are inserted, and at the extremity; the lip is long, somewhat oval, and slightly hollowed at the apex; the sternum is oval, with small eminences on the sides, opposite to the insertion of the legs, and is supplied with long, gray hairs. These parts are black, tinged with brown. The legs are robust, provided with hairs and sessile spines, and are of a reddish-brown colour, with longitudinal streaks of a lighter shade; the fourth pair is the longest, then the second, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws, below which there is a small scopula. The palpi resemble the legs in colour, but are darker at the extremity of the digital joint, which is armed with a curved claw. The abdomen is of an oblong-oviform figure, projecting a little over the base of the cephalo-thorax, and is densely covered with short, silky, gray hairs; the sexual organs are of a dark, reddish-brown colour, and the branchial opercula have a dull-yellow hue.

The abdomen of the male differs from that of the female in being slenderer. The radial joint of the palpi is rather shorter than the cubital, and projects a large, crescent-shaped apophysis from its extremity, on the outer side, which has an obtuse process on the outer side of its superior limb; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs; these organs are highly developed, not complicated in structure, with a short, curved, pointed process at their extremity, and are of a very dark-brown colour.

*Clubiona holosericea*, in common with other species of the genus, can run securely on the

perpendicular surfaces of dry, polished bodies, by means of an adhesive secretion emitted from its scopulæ. It is most abundant in well-wooded districts, constructing a cell of white silk, which serves it for a domicile, on the under side of leaves or behind the exfoliating bark of old trees. In June the female spins in this cell a lenticular cocoon of fine, white silk, measuring one fourth of an inch in diameter, and deposits in it about 109 spherical eggs of a yellowish-white colour, not agglutinated together. From this period she appears to direct her attention exclusively to her progeny, constantly remaining on or near the cocoon.

Mr. J. Hardy has taken this species in Berwickshire.

CLUBIONA AMARANTHA. Pl. VII, fig. 76.

*Clubiona amarantha*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 591.

— — Hahn, Die Arachn., Band i, p. 113, tab. 29, fig. 85.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 42.

Length of the female,  $\frac{5}{16}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{9}$ th, breadth,  $\frac{1}{12}$ th; breadth of the abdomen,  $\frac{1}{9}$ th; length of a posterior leg,  $\frac{7}{40}$ ths; length of a leg of the third pair,  $\frac{11}{48}$ ths.

The eyes are disposed on the anterior part of the cephalo-thorax in two transverse rows; the posterior row is the longer, and the interval between the intermediate eyes is greater than the space which separates them from the lateral ones of the same row; the anterior row is situated very near to the frontal margin, and the intermediate eyes, which are rather the smallest of the eight, form with those of the posterior row a trapezoid whose shortest side is before. The cephalo-thorax is somewhat oval, convex, broadly rounded in front, sparingly covered with fine, silky hairs, and is of a yellowish-brown colour, with a tinge of red on the anterior part, where the eyes are seated. The falces are powerful, conical, rather prominent, and provided with long hairs and a few minute teeth on the inner surface; the maxillæ are long, straight, gibbous near the base, enlarged where the palpi are inserted, and at the extremity, which is obliquely truncated and fringed with long hairs on the inner side; the lip is moderately long, truncated at the apex, and slightly contracted at the base. These parts have a dark-brown hue; the base of the maxillæ is the palest, and the falces are tinged with red. The sternum is oval, glossy, thinly covered with long hairs, and has eminences on the sides, opposite to the legs; it is of a pale, yellowish-brown colour, with minute, reddish-brown spots on the lateral margins. The legs are provided with hairs and sessile spines, and are of a pale, yellowish-brown colour; the fourth pair is the longest, then the second, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws, below which there is a small scopula. The palpi are short, and resemble the legs in colour. The abdomen is of an oblong-oviform figure, densely covered with short, silky hairs, and projects a little over the base of the cephalo-thorax; it is of a brownish-red colour, the under part being the palest, and has a band of a darker hue extending from the anterior extremity, where there

are some black hairs, along the middle of the upper part, about half of its length; this band terminates in a point, between which and the spinners there is a series of obscure, yellowish-brown, angular lines, whose vertices are directed forwards; the spinners are of a pale, yellowish-brown hue; the branchial opercula are of a yellowish-white colour; and the sexual organs have a reddish-brown tint. The female becomes much darker coloured after she has deposited her eggs.

The abdomen of the male is slenderer and lighter coloured than that of the female, its prevailing hue being yellowish-red; and the falces, maxillæ, and lip have a reddish-brown tint. The cubital and radial joints of the palpi are short, the latter projecting from its extremity, on the outer side, a crescent-shaped apophysis of a dark-brown colour, whose anterior limb is the longer and more obtuse; the digital joint is of a brown hue; it is of an oblong-oval form, convex and hairy externally, concave within, comprising the palpal organs, which are moderately developed, not very complicated in structure, of a sub-cylindrical figure, with a strong, curved, corneous spine at their extremity, whose point projects on the outer side; and contiguous to it there is a pale, membranous prominence, having near its base a small, dark, glossy protuberance. The colour of these organs is dark-brown, tinged with red.

The haunts, habits, and economy of this species are similar to those of *Clubiona holosericea*. The female deposits about 145 spherical eggs, of a yellowish-white colour, not agglutinated together, in a lenticular cocoon of white silk of a fine texture, measuring three tenths of an inch in diameter. This cocoon, for which she manifests much solicitude, is inclosed in a cell of white silk fabricated on the inferior surface of a leaf, the sides of which are curved upon it, and are retained in that position by silken lines. Towards the end of June, or the beginning of July, the eggs are hatched; but the young, like those of all other spiders whose economy is known, do not quit the cocoon till they have completed their first change of integument.

*Clubiona amarantha* has been found in Scotland and Ireland.

#### CLUBIONA EPIMELAS. Pl. VII, fig. 77.

*Clubiona epimelas*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 592.

— — Blackw., Linn. Trans., vol. xix, p. 115.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 43.

Length of the female,  $\frac{2}{5}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{6}$ th, breadth,  $\frac{1}{8}$ th; breadth of the abdomen,  $\frac{2}{60}$ ths; length of a posterior leg,  $\frac{1}{2}$ ; length of a leg of the third pair,  $\frac{2}{23}$ ths.

The cephalo-thorax is somewhat oval, convex, broadly rounded in front, and thinly covered with yellowish-white or grayish hairs; it is of a dark-brown colour, veined with black lines, and has narrow, black, lateral margins. The falces are strong, conical, convex in front, prominent, and armed with two rows of teeth on the inner surface; the maxillæ are long, straight, powerful, enlarged where the palpi are inserted, and at the extremity, which

is truncated obliquely on the inner side; the lip is somewhat oval, but truncated at the apex; the sternum is of a narrow oval form, with distinct eminences opposite to the legs. These parts are of a brownish-black hue, the middle of the sternum and the extremities of the maxillæ and lip having a reddish tinge. The eyes form two transverse rows on the anterior part of the cephalo-thorax; the posterior row is the longer, and the interval between the intermediate eyes is greater than the space which separates them from the lateral ones of the same row; the eyes of the anterior row are situated very near to the frontal margin. The legs and palpi are robust, and are provided with hairs and sessile spines; they are of a dark, reddish-brown colour, with longitudinal lines of a deeper and lighter shade on the upper side; the fourth pair of legs is the longest, then the second, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws, below which there is a small scopula. The abdomen is of an oblong-oviform figure, projecting a little over the base of the cephalo-thorax; it is of a very dark-brown colour, and is covered with yellowish-white hairs, approaching to gray on the under side; the spinners are rather prominent, and the branchial opercula are large, and of a yellow hue.

The male is smaller than the female, and its cephalo-thorax, legs, and palpi are paler; its falces also are longer and more prominent. The cubital and radial joints of the palpi are short; the latter projects two apophyses from its extremity, on the outer side; the anterior one, which is the larger, is obtuse, and the posterior one terminates in a point; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs; they are highly developed, prominent, not complicated in structure, and of a very dark-brown colour.

Crevices in stone walls and the under side of fallen leaves are the usual haunts of *Clubiona epimelas*, which is found, though rarely, in the wooded parts of Denbighshire and Caernarvonshire. The male has the palpal organs completely developed in May, and in June the female constructs a plano-convex cocoon of white silk of a very fine texture, measuring  $\frac{3}{10}$ ths of an inch in diameter, in which she deposits about 154 spherical eggs of a pale-yellow colour, not agglutinated together. The cocoon is attached by its plane surface to the under side of a stone or leaf, and is inclosed in a sac of white silk, which also comprises the female.

#### CLUBIONA FORMOSA. Pl. VII, fig. 78.

*Micrommata formosa*, Templeton, MS. History of Irish Arachnida.

Length of the female,  $\frac{3}{10}$ ths of an inch.

The legs are hairy, spiny, and of a pale hue, with the exception of the last joints of the tibiæ and tarsi, which are jet-black underneath. The cephalo-thorax is oval, elongate, and of a pale, yellowish-brown colour, with dark margins; the part including the eyes has a reddish tint, and an abbreviated black line occupies the middle thoracic point; underneath it is of a dark, castaneous-brown hue. The abdomen is of an elongate oval form; the upper part has a reddish-brown colour, with four impressed dots near the middle, which form a

quadrangle, and a series of abbreviated, pale, transverse, irregular lines extending from the base to the spinners, to which numerous pale lines approach from the sides and from before, those on the anterior part of the sides being white, nearly straight, and running almost directly backwards; the under part is of a castaneous-brown colour, with four longitudinal rows of pale dots extending from the base to the spinners, and slightly converging.

This spider was caught running among grass at Cranmore, in Ireland, and is very rare.

CLUBIONA CORTICALIS. Pl. VII, fig. 79.

*Clubiona corticalis*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 593.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 43.

— *domestica*, Wider, Museum Senckenb., Band i, p. 214, taf. 14, fig. 9.

*Philoica notata*, Koch, Die Arachn., Band viii, p. 55, tab. 268, figs. 631, 632.

*Titulus* 22, Lister, Hist. Animal. Angl., De Aran., p. 70.

Length of the female,  $\frac{7}{16}$ ths of an inch; length of the cephalo-thorax,  $\frac{3}{20}$ ths, breadth,  $\frac{1}{9}$ th; breadth of the abdomen,  $\frac{3}{16}$ ths; length of a posterior leg,  $\frac{9}{20}$ ths; length of a leg of the third pair,  $\frac{5}{16}$ ths.

The eyes are disposed in two transverse rows on the anterior part of the cephalo-thorax; the posterior row is the longer, and the anterior row is situated very near to the frontal margin; the intermediate eyes of both rows form a trapezoid whose shortest side is before, those of the anterior row being the largest of the eight. The cephalo-thorax is somewhat oval, convex, slightly compressed before, broadly rounded in front, and thinly covered with short hairs; the falces are powerful, conical, rather prominent, and armed with a few teeth on the inner surface; the maxillæ are long, straight, gibbous near the base, enlarged where the palpi are inserted, and at the extremity, which is obliquely truncated and fringed with hairs on the inner side; the lip is moderately long, and truncated at the apex; the sternum is oval, with small eminences on the sides, opposite to the legs; the legs are robust, and are provided with hairs and sessile spines; the fourth pair is the longest, then the second, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws, below which there is a small scopula. These parts, with the palpi, are of a reddish-brown colour, the anterior part of the cephalo-thorax, the falces, maxillæ, lip, and margins of the sternum being much the darkest, and the legs and palpi the palest. The abdomen is of an oblong-oviform figure, densely covered with hairs, and projects a little over the base of the cephalo-thorax; the upper part is of a dark-brown colour; a broad band of yellowish-brown extends along the middle, and comprises a very dark-brown band, which tapers towards the spinners; the posterior half of the latter band is crossed by lines of the same hue, forming obtuse angles whose vertices are directed forwards; the sides are of a dark-brown hue, and the under part has a yellowish-brown tint; the spinners are prominent,



and of a pale, reddish-brown colour; and that of the branchial opercula is yellowish-white.

The sexes differ in size and in the relative length of their legs, the male, which is smaller than the female, having the second pair of legs longer than the fourth pair. The radial joint of the palpi is slenderer than the cubital, and has a small, creseent-shaped apophysis at its extremity, on the outer side, the anterior limb of which is much the darker coloured; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs; these organs are highly developed and very prominent, extending upwards to the articulation of the radial with the cubital joint; they are simple in external structure, have a minute, pointed spine at their extremity, and are of a pale, red-brown colour.

In the wooded parts of Denbighshire this spider is found among ivy and lichens growing on trees. It spins a large sac of white silk on the under side of leaves or behind exfoliating bark, in which the female constructs a cocoon of a lenticular form in the month of July; it is composed of white silk, of a very fine texture, is three tenths of an inch in diameter, and contains between thirty and forty spherical eggs of a pale-yellow colour, not agglutinated together.

CLUBIONA BREVIPES. Pl. VII, fig. 80.

*Clubiona brevipes*, Blackw., Linn. Trans., vol. xviii, p. 603.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 43.

Length of the female,  $\frac{1}{4}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{14}$ th; breadth of the abdomen,  $\frac{1}{12}$ th; length of a posterior leg,  $\frac{1}{4}$ th; length of a leg of the third pair,  $\frac{1}{6}$ th.

The eyes are arranged on the anterior part of the cephalo-thorax in two transverse, parallel rows; the anterior row is the shorter, and is situated immediately above the frontal margin; the intermediate eyes of both rows form a trapezoid whose shortest side is before, those of the anterior row being the largest of the eight. The cephalo-thorax is convex, glossy, rounded on the sides, broadly truncated in front, and sparingly covered with short hairs; its colour is dark-brown, the anterior part and lateral margins being much the darkest. The falces are powerful, conical, convex at the base, in front, rather prominent, armed with a few teeth on the inner surface, and of a very dark-brown colour, approaching to black. The lip is somewhat oval, truncated at the apex, and resembles the falces in colour. The maxillæ are long, straight, enlarged where the palpi are inserted, and at the extremity, which is rounded. The sternum is oval, glossy, with small eminences on the sides, opposite to the legs; its colour, and that of the maxillæ, is dark, reddish-brown. The legs are short, and of a pale, dull-yellowish hue; the fourth pair is the longest, then the second, and the third pair is rather the shortest; each tarsus is terminated by two curved, pectinated claws, and below them there is a small seopula. The palpi, which are short, have a curved

claw at their extremity, and resemble the legs in colour. The abdomen is oviform, hairy, slightly depressed, and projects over the base of the cephalo-thorax; it is of a dark, reddish-brown hue, the medial line of the anterior half of the upper part being the darkest; the spinners are prominent and of a dark-brown colour; and the branchial opercula have a pale, red-brown tint.

The sexes differ very little in colour, but the male is smaller than the female. The cubital and radial joints of the palpi are short; the latter has a large apophysis at its extremity, which tapers to a bifid termination curved in front of the digital joint, a strong, obtuse process occurring within the curve, near its base; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, complicated in structure, with a prominent, obtuse, corneous process near their extremity, and a curved, pointed spine, directed outwards, extending nearly to the termination of the joint; their colour is very dark brown.

M. Walckenaer has confounded this species with *Clubiona amarantha* ('Hist. Nat. des Insect. Apt.,' tom. iv, p. 439), from which it differs in magnitude, in colour, in the relative size of its eyes, and, as regards the male, in the structure of its palpi and palpal organs. It commonly occupies a cell of compact white silk, constructed on the inferior surface of leaves and of lichens growing on the trunks of trees in the woods of North Wales. Though not particularly active in its general movements, yet it can leap with agility.

Specimens of *Clubiona brevipes*, taken in Berwickshire, were received from Mr. J. Hardy in 1858.

CLUBIONA COMTA. Pl. VII, fig. 81.

*Clubiona comta*, Koch, Die Arachn., Band vi, p. 16, tab. 185, fig. 440.

— — Koch, Die Arachn., Band x, p. 129, tab. 358, fig. 841.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 44.

— *compta*, Walck., Hist. Nat. des Insect. Apt., tom. ii, p. 478.

— *fucata*, Blackw., Linn. Trans., vol. xviii, p. 605.

Length of the female,  $\frac{3}{16}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{16}$ th, breadth,  $\frac{1}{16}$ th; breadth of the abdomen,  $\frac{1}{14}$ th; length of a posterior leg,  $\frac{1}{4}$ th; length of a leg of the third pair,  $\frac{1}{6}$ th.

The eyes are seated on black spots, and form two transverse, parallel rows on the anterior part of the cephalo-thorax, the anterior row, which is the shorter, being situated immediately above the frontal margin; the intermediate eyes of both rows describe a trapezoid whose shortest side is before, those of the anterior row being the smallest of the eight. The cephalo-thorax is oval, convex, glossy, and thinly covered with short hairs; the colour of the anterior part is reddish-brown, that of the sides and posterior part greenish-brown, and a fine, dark-brown line occurs on the lateral margins. The falces are powerful, conical, and rather prominent; the maxillæ are long, straight, enlarged where the palpi are inserted, and at the

extremity, which is rounded; the lip is longer than broad, and its figure is nearly quadrangular. These parts are of a reddish-brown colour. The sternum is oval, glossy, and has small eminences on the sides, opposite to the legs; it is of a yellowish-brown hue, with dark, reddish-brown spots on the lateral margins. The legs are provided with hairs and sessile spines, a row of the latter occurring on each side of the inferior surface of the tibiæ and metatarsi of the first and second pairs, and their colour is yellowish-brown; the fourth pair is the longest, then the second, and the third pair is rather the shortest; each tarsus is terminated by two curved, pectinated claws, and below them there is a small scopula. The short palpi have a small, curved claw at their extremity, and their colour is similar to that of the legs. The abdomen is oviform, hairy, slightly depressed, and projects over the base of the cephalo-thorax; it is of a yellowish-brown hue, with a dark, reddish-brown band on the upper part, which extends nearly half of its length from the anterior extremity along the middle, the interval between the band and the spinners being occupied by a series of triangular spots of the same colour; on each side of the medial line there is an irregular, longitudinal, dark, reddish-brown band whose continuity is somewhat interrupted; the margins of the sexual organs and three narrow bands, situated between them and the spinners, have a dark, reddish-brown tint; and that of the branchial opercula is yellowish-white.

The abdomen of the male is slender and of a dark-brown hue above, with two or three yellowish-brown lines extending from the anterior part about a third of its length, and between these lines and the spinners there are two parallel rows of oval spots of the same colour, which are inclined towards each other and decrease in size as they approach the anus. The maxillæ are very gibbous at the base, and greatly enlarged at the extremity. The cubital and radial joints of the palpi are short; the latter is rather the smaller, and has a large, dark-brown apophysis at its extremity, on the outer side, which is prolonged into a slender, much curved, finely pointed spine; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs; these organs, which are moderately developed, have a spine-like process curved from the inner side round their extremity, and are of a red-brown colour. In other particulars the male closely resembles the female.

*Clubiona fucata*, Blackwall, which is identical with the *Clubiona comta* of M. Koch, is placed by M. Walckenaer among the synonyma of *Clubiona corticalis* ('Hist. Nat. des Insect. Apt.,' tom. iv, p. 439); yet it is not only very much smaller than that species, from which it differs decidedly in colour and in the relative size of its eyes, but the structure of the palpi and of the palpal organs also is widely dissimilar in the male.

This rare spider has been taken in the woods of Denbighshire and Caernarvonshire; also in Middlesex, Berwickshire, and in the north of Lancashire. It conceals itself among the foliage of trees and shrubs in summer, constructing a cell of white silk on the inferior surface of a leaf, the sides of which are curved towards it and retained in that position by fine lines of silk. The male has the palpal organs completely developed in June, and in that month females may be seen having the abdomen greatly distended with eggs.

CLUBIONA PALLENS. Pl. VIII, fig. 82.

*Clubiona pallens*, Koch, Die Arachn., Band vi, p. 19, tab. 185, figs. 443, 444.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xiv, p. 30.

Length of the female,  $\frac{1}{8}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{16}$ th, breadth,  $\frac{1}{24}$ th, breadth of the abdomen,  $\frac{1}{20}$ th; length of a posterior leg,  $\frac{3}{20}$ ths; length of a leg of the third pair,  $\frac{1}{10}$ th.

The cephalo-thorax is somewhat oval, broadly rounded in front, sparingly clothed with fine, short hairs, convex, glossy, and of a yellowish-brown colour, faintly tinged with olive green, the anterior part being the darkest. The eyes are disposed in two transverse rows on the anterior part of the cephalo-thorax; the anterior row is situated immediately above the frontal margin, and is nearly straight, the two intermediate eyes being the largest and darkest of the eight; the posterior row, which is the longer, is curved, with its convexity directed backwards, and the two intermediate eyes are separated by a wider interval than that which divides them from the lateral eyes of the same row. The falces are strong, conical, prominent, and have one or two small teeth and some long hairs on the inner surface; the maxillæ are long, straight, and enlarged where the palpi are inserted and at the extremity; and the lip is somewhat oval, but truncated and slightly notched at its extremity. These organs are of a reddish-brown colour, the falces being much the darkest. The sternum is oval, and has small eminences on the lateral margins, opposite to the legs; the legs are moderately long, and provided with hairs and sessile spines; the fourth pair is the longest, then the second, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws, below which there is a small scopula. These parts, with the palpi, are of a pale, yellowish-brown hue. The abdomen is of an oblong-oviform figure, and is covered with short, fine hairs; it is convex above, projecting a little over the base of the cephalo-thorax, and of a yellowish-red colour, the under part being the palest, and has some black hairs at its anterior extremity; the sexual organs have a red-brown tint, and that of the branchial opercula is pale-yellow.

The sexes are similar in colour, but the male is smaller than the female. Its palpi are short; the radial is smaller than the cubital joint, and projects a long, dark-brown, pointed apophysis from its extremity, on the outer side; the digital joint is of a brown hue, and is as broad at the extremity as at the base; it is convex and hairy externally, concave within, comprising the palpal organs, which are moderately developed, not very complicated in structure, and of a dark-brown colour, tinged with red.

Three adult females and an adult male of *Clubiona pallens* were received in October, 1853, from the Rev. Hamlet Clark, who took them at Holme Fen, in Huntingdonshire, about the middle of September, in the same year.

The *Clubiona pallens* of M. Hahn ('Die Arachn.,' Band ii, p. 10, tab. 40, fig. 101) is not included among the synonyma of the above species, as there appears to be much uncertainty

about its identity. M. Walckenaer has added the *Clubiona pallens* of M. Koch to the synonyma of *Clubiona amarantha* ('Hist. Nat. des Insect. Apt.,' tom. ii, p. 478), supposing it to be the latter species in an immature state, for he remarks that "C'est une jeune que M. Koch a décrite;" this, however, is a mistake, as it is undoubtedly a smaller and perfectly distinct species, and M. Koch's figure of the male clearly represents an individual with the palpal organs fully developed.

CLUBIONA ACCENTUATA. Pl. VIII, fig. 83.

*Clubiona accentuata*, Walek., Hist. Nat. des Insect. Apt., tom. i, p. 594.

— Sund., Vet. Acad. Handl., 1832, p. 268.

— Blackw., Linn. Trans., vol. xix, p. 115.

— Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 96.

— *punctata*, Hahn, Die Arachn., Band ii, p. 8, tab. 39, fig. 99.

*Agelena obscura*, Sund., Vet. Acad. Handl., 1831, p. 128.

*Anyphaena accentuata*, Sund., Consp. Arachn., pp. 20, 21.

— Koch, Uebers. des Arachn. Syst., erstes Heft, p. 18.

Length of the female,  $\frac{1}{4}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{10}$ th, breadth,  $\frac{1}{12}$ th; breadth of the abdomen,  $\frac{1}{10}$ th; length of an anterior leg,  $\frac{7}{10}$ ths; length of a leg of the third pair,  $\frac{1}{4}$ th.

The legs are long, moderately robust, provided with hairs and sessile spines, and of a yellowish-brown colour spotted with black; the first pair is the longest, then the fourth, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws, and below them there is a small scopula. The palpi resemble the legs in colour, and have a curved claw at their extremity. The cephalo-thorax is somewhat oval, slightly compressed before, convex, hairy, and has a small, dark, longitudinal indentation in the medial line of the posterior region; it is of a yellowish-brown colour, with a broad, irregular, black band extending along each side. The eyes are disposed in two transverse rows on the anterior part of the cephalo-thorax; the posterior row, which is the longer, is curved, and forms a semicircle nearly with the anterior row, which is situated very near to the frontal margin; the intermediate eyes of the anterior row are the smallest of the eight, and, with those of the posterior row, describe a trapezoid whose shortest side is before. The falces are strong, conical, vertical, armed with a few minute teeth on the inner surface, and of a pale, reddish-brown hue, with an irregular, dark-brown spot in front. The maxillæ are straight, powerful, increasing gradually in breadth from the base to the extremity, which is rounded, and are of a pale, yellowish-brown colour. The lip is truncated at the apex, and of an elongated quadrilateral figure; it has a brownish-black hue at the base, and a pale, reddish-brown tint at the extremity. The sternum is heart-shaped, glossy, thinly clothed with hairs, and has eminences on the sides, opposite to the legs; it is encircled by a broad, irregular, black



border, and has a yellowish-brown hue in the middle. The abdomen is oviform, densely covered with hairs, convex above, projecting a little over the base of the cephalo-thorax; it is of a reddish-brown colour on the upper part, with two angular, black lines, whose vertices are directed forwards, situated near the middle, one immediately before the other; the sides and posterior extremity are thickly spotted with black; the under part has a yellowish-brown hue, with some scattered, black spots, and a black band extending from the sexual organs, along the middle, about halfway towards the spinners, where it terminates at a short, transverse fold; the superior spinners are longer than the rest; and the branchial opercula are of a pale-yellow hue.

The male, though it bears a strong general resemblance to the female, presents several marked points of difference; it is rather smaller, darker coloured, and the absolute length of its legs is greater, an anterior one measuring thirteen twenty-fourths of an inch. The irregular black band, extending along each side of the cephalo-thorax, comprises three yellowish-brown spots, diverging from its upper towards its lower margin. The femora have a broad, black annulus at their extremity, the annuli of the first and second pairs of legs being the most distinctly marked. The humeral joint of the palpi has a tuft of long, coarse, black bristles near its base, on the under side; and the radial joint, which is longer than the cubital, has some coarse, black bristles on the upper side, and a brownish-black apophysis, somewhat crescent-shaped, with one limb very obtuse and the other acute, placed transversely on the outer side of its extremity; the digital joint is oval, of a dark-brown hue, convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, not very complicated in structure, with a small, curved spine at the extremity, on the outer side, and are of a dark-brown colour.

This active spider is of frequent occurrence in the woods of North Wales, running with great rapidity among the foliage of the trees, and sometimes concealing itself under the lichens which grow upon their trunks and branches. In June the female deposits about 157 spherical eggs of a pale, yellowish-white colour, not agglutinated together, in a lenticular cocoon of white silk of a very fine texture, measuring seven sixteenths of an inch in diameter; it is inclosed in a sac of the same material, attached to the inferior surface of a leaf, the sides of which are curved downwards, and are held in that position by silken lines connecting them with the sac. The female generally places herself on or near the cocoon, but speedily abandons it on being disturbed.

A female of this species was received from Mr. J. Hardy, in 1858, who took it in Berwickshire.

#### CLUBIONA DOMESTICA. Pl. VIII, fig. 84.

*Clubiona domestica*, Wider, Museum Senckenb., Band i, p. 214, taf. 14, fig. 9.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xi, p. 115.

*Philoica notata*, Koch, Die Arachn., Band viii, p. 55, tab. 268, figs. 631, 632.

The eyes are seated on black spots, and disposed on the anterior part of the cephalo-thorax in two transverse rows; the posterior row is somewhat curved, having its convexity directed backwards, and the anterior row, which is the shorter, and situated a little above the frontal margin, is almost straight; the lateral eyes of the posterior row are the largest, and the two intermediate ones of the same row are the smallest of the eight. The cephalo-thorax is convex, thinly clothed with short hairs, slightly compressed before, rounded on the sides, and has a narrow indentation in the medial line; it is of a brownish-yellow colour, with a somewhat irregular, brownish-black band extending along each side, and narrow, lateral margins of the same hue. The falces are powerful, conical, rather prominent, armed with minute teeth on the inner surface, and have a pale, reddish-brown tint. The maxillæ are straight, convex near the base, and rounded at the extremity; the lip is short and somewhat quadrate; and the sternum is oval, with small prominences on the sides, opposite to the legs. These parts are of a pale, brownish-yellow colour. The legs are moderately long, provided with hairs, and with two parallel rows of sessile spines on the inferior surface of the tibiæ and metatarsi of the first and second pairs, and are of a pale, brownish-yellow hue, with a few obscure, dark annuli; the fourth pair is the longest, then the first, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws. The palpi resemble the legs in colour, and the digital joint, which is the darkest, has a small, curved, pectinated claw at its extremity. The abdomen is hairy, of an oblong-oviform figure, convex above, projecting a little over the base of the cephalo-thorax; the upper part is of a dull, yellowish-brown colour, with a longitudinal, black band in the middle of the anterior part, which gradually increases in breadth to its posterior extremity, and between this band and the spinners there is a series of angular lines whose vertices are directed forwards; the brownish-black sides are mottled with yellowish-brown, and the under part is of a dull, yellowish-brown colour.

According to M. Koch, the male is smaller and slenderer than the female, but its legs are longer in proportion to its size. The radial joint of its palpi is not so strong as the cubital, and is curved downwards; the digital joint is of an oblong-oval form, convex and hairy externally, concave within, comprising the palpal organs, which are moderately developed and uneven.

The length of the adult female *Philoica notata* (*Clubiona domestica*) is stated by M. Koch to be from four to four and a half lines. An immature female, captured in Gloucestershire in 1852, was received from Mr. R. H. Meade, in the autumn of the same year; and in the autumn of 1858, the Rev. O. P. Cambridge took a young female in Dorsetshire.

M. Walckenaer is certainly mistaken in supposing this species to be identical with *Clubiona corticalis* ('Hist. Nat. des Insect. Apt.,' t. iv, p. 439), from which it differs in organization and colour. The males are very dissimilar, not only differing remarkably in the relative length of their legs, but also in the structure of the palpi and palpal organs. The genus *Philoica* of M. Koch, like some of the other genera which he has proposed for adoption, comprises spiders belonging to different families.

## CLUBIONA NUTRIX. Pl. VIII, fig. 85.

*Clubiona nutrix*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 601.

— — Latr., Gen. Crust. et Insect., tom. i, p. 92.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 96.

*Drassus maxillosus*, Wider, Museum Senckenb., Band i, p. 209, taf. 14, fig. 8.

*Anyphaena nutrix*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 18.

*Cheiracanthium nutrix*, Koch, Die Arachn., Band vi, p. 9, tab. 182, figs. 434, 435.

M. Walckenaer states that *Clubiona nutrix* varies in length from six to nine lines ('Hist. Nat. des Insect. Apt.,' t. i, p. 601).

The subjoined description is abridged from the German of M. Koch ('Die Arachn.,' Band vi, pp. 9—11).

The legs of the female are long, provided with hairs and erect spines, and are of a pale-yellow colour, the extremity of the tarsi having a blackish hue; the first pair is the longest, then the fourth, and the third pair is the shortest. The palpi are of the usual structure, and resemble the legs in colour. The cephalo-thorax is somewhat oval, slightly depressed in front, convex, and glossy, with an oblong indentation in the medial line of the posterior region; its colour is yellow, tinged with olive; the anterior part has a pale-reddish tint, and the lateral margins are of a light-yellow hue. The eyes are black; those of the anterior row are situated immediately above the frontal margin of the cephalo-thorax, and the intermediate pair is seated on an oval, transverse, brown spot. The falces are rather long, powerful, densely fringed with hairs on the inner surface, and of a reddish-yellow hue, except at the extremity, which is blackish; the colour of the fang is red, being darkest at the base. The sternum is slightly convex, glossy, and of a yellow hue. The abdomen is oviform, convex, provided with fine hairs, and of a greenish-yellow colour, reticulated with green; a rusty-brown band, which tapers to its extremity, extends along the middle of the anterior half of the upper part; on each side of this band there is a border of a rusty-reddish hue, and between it and the spinners a large, rusty-red patch occurs; the under part is somewhat darker than the sides, along which a stripe, composed of small, yellowish spots, extends; and the branchial opercula ("die Bauchschilde vor den Luftlöchern") have a light-yellow tint.

The male is found in a state of maturity in June and July. Its cephalo-thorax resembles that of the female in form and colour, but the lateral margins are lighter. The falces are very long, divergent at their anterior part, and of a rusty-red hue, with black extremities. The legs and palpi are very long, and have an ochreous-yellow tint. The humeral and radial joints of the palpi are somewhat curved, and the latter projects a curved, brown-red apophysis from its extremity, on the outer side; the digital joint is long, convex and hairy, curved upwards at the extremity, and has a long, fine, pointed spine at its base, on the outer side, which is curved backwards; this joint has a reddish-brown hue, and forms a cover above the palpal organs, which are moderately developed, somewhat oval, and of a chestnut colour. The sternum is of a rusty-yellow hue, with a broad, brown border. The abdomen

is smaller than that of the female, and of a yellowish-ochreous colour (whitish when viewed obliquely), but has rather a reddish tinge in the posterior region of the upper part; the longitudinal band in the middle of the anterior half has a brownish-rusty hue; and the branchial opercula are of a fine yellow colour.

According to Dr. Leach, this spider has been taken once in England, near Cheltenham. See the Supplement to the fourth, fifth, and sixth editions of the 'Encyclopædia Britannica,' article "Annulosa."

As the identity of the *Clubiona nutrix* of M. Hahn with the species whose name it bears is not clearly ascertained, it will suffice to remark that M. Walckenaer has assigned to it a place among the synonyma of *Clubiona erratica*, and that M. Koch entertains the opinion that Hahn's description is referable to the former species, and his figure to the latter; his words are, "der Beschreibung nach hatte Hahn unbezweifelt Club. Nutrix, Walck. vor sich, dagegen deutet freilich dessen Abbildung auf Club. erratica." ('Die Arachn.,' Band vi, p. 15.)

CLUBIONA ERRATICA. Pl. VIII, fig. 86.

*Clubiona erratica*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 602.

— — Blackw., Linn. Trans., vol. xix, p. 115.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 96.

*Bolyphantes equestris*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 9.

*Cheiracanthium carnifex*, Koch, Die Arachn., Band vi, p. 14, tab. 181, figs. 438, 439.

Length of the female,  $\frac{7}{10}$ ths of an inch; length of the cephalo-thorax,  $\frac{3}{20}$ ths, breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{3}{20}$ ths; length of an anterior leg,  $\frac{3}{5}$ ths; length of a leg of the third pair,  $\frac{3}{10}$ ths.

The legs are long, slender, provided with hairs, and of a light, yellowish-brown colour; the first pair is much the longest, the fourth pair surpasses the second, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws, and below them there is a small scopula. The palpi resemble the legs in colour, with the exception of the extremity of the digital joint, which has a brown hue, and appears to be somewhat dilated. The cephalo-thorax is slightly compressed before, convex, glossy, thinly clothed with hairs, depressed and broadly truncated in front, and of a reddish-brown hue. The falces are powerful, conical, vertical, fringed with hairs on the inner surface, and of a red-brown colour, except at the extremity, which has a blackish tint. The maxillæ are straight, enlarged and rounded at the extremity, and rather paler than the falces. The lip is curved on the sides, truncate at the apex, and of a reddish-brown hue. The sternum is heart-shaped, having small eminences on the sides, opposite to the legs; it has a yellowish-brown tint, with broad, brownish-black, lateral margins. The eyes are disposed in two transverse rows on the anterior part of the cephalo-thorax, those constituting the anterior row, which are situated immediately above the frontal margin, being rather the largest; the eyes of each lateral pair

are seated obliquely on a small tubercle, and are almost contiguous. The abdomen is oviform, pointed at the posterior extremity, sparingly clothed with hairs, glossy, convex above, projecting over the base of the cephalo-thorax; it is of an olive-green colour, and has a dark, red-brown band, bordered with yellow, extending along the middle of the upper part; four small depressions, forming a quadrilateral figure, occur on the upper part, and a yellow line, originating at the anterior pair, passes obliquely along each side to a point below the spinners; two parallel lines of the same hue are produced from the branchial opercula, which have a bright-yellow tint, to the spinners; the colour of the sexual organs is very dark, reddish-brown.

The abdomen of the male is smaller than that of the female, but its legs are longer. Its falces are long, prominent, and somewhat divergent at the extremity. The radial joint of the palpi is longer and slenderer than the cubital, and has a pointed apophysis at its extremity, on the outer side, and a very minute one on the inner side; the digital joint has an oblong-oval form, and projects from its base, on the outer side, a long, fine, pointed spine which is curved backwards; it has a reddish-brown hue, is convex and hairy externally, and concave within, comprising the palpal organs; these organs are moderately developed, provided with one or two spine-like processes, and of a brownish-black colour.

Specimens of this handsome species are frequently met with in woods and on commons in the west of Denbighshire. In July the female constructs a cell of white silk, of a compact texture, among the stems of gorse, heath, or the leaves of plants, which she curves about it and secures in that position by means of silken lines. In this cell she deposits about 140 eggs of a deep-yellow colour, not agglutinated together; they are contained in an exceedingly delicate tissue of white silk, of a subglobose form, measuring one fourth of an inch in diameter, which is attached to the surface of the cell. The female, after the deposition of her eggs, does not appear to quit the cell even for the purpose of procuring food.

A collection of spiders made by the Rev. Hamlet Clark, in the autumn of 1842, at Wappenham, in Northamptonshire, comprised specimens of this species.

*Genus* ARGYRONETA (*Latreille*).

*Eyes* disposed on the anterior part of the cephalo-thorax in two transverse rows; they do not differ remarkably in size, but the intermediate ones of the anterior row, which are seated on a minute prominence, are the smallest, and, with those of the posterior row, describe a trapezoid whose shortest side is before; each lateral pair is placed obliquely on a tubercle.

*Maxillæ* powerful, rounded at the extremity, and inclined towards the lip.

*Lip* long, triangular, dilated at the base, and rounded at the apex.

*Legs* robust; the first pair is the longest, then the fourth, the third pair being the shortest.



## ARGYRONETA AQUATICA. Pl. VIII, fig. 87.

*Argyroneta aquatica*, Latr., Gen. Crust. et Insect., tom. i, p. 94.

- — Walck., Hist. Nat. des Insect. Apt., tom. ii, p. 378, pl. 22, fig. 4.
- — Sund., Vet. Acad. Handl., 1831, p. 131.
- — Hahn, Die Arachn., Band ii, p. 33, tab. 49, fig. 118.
- — Koch, Uebers. des Arachn. Syst., erstes Heft, p. 14.
- — Koch, Die Arachn., Band viii, p. 60, tab. 269, fig. 636.
- — Blackw., Linn. Trans., vol. xix, p. 116.
- — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii,  
p. 97.

Length of the female,  $\frac{2}{30}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{5}$ th, breadth,  $\frac{3}{20}$ ths; breadth of the abdomen,  $\frac{1}{5}$ th; length of an anterior leg,  $\frac{3}{5}$ ths; length of a leg of the third pair,  $\frac{2}{30}$ ths.

The eyes constituting each lateral pair are seated obliquely on a tubercle, but are not contiguous. The cephalo-thorax is glossy, compressed before, convex at the anterior part, somewhat depressed on the sides, which are marked with furrows converging towards the middle, and is slightly hairy; the falces are powerful, conical, vertical, divergent at the extremity, and armed with three teeth on the anterior and two on the posterior side of the space which receives the fang when in a state of repose; the maxillæ are strong, and slightly inclined towards the lip, which is triangular and rounded at the apex; the sternum is heart-shaped, and densely covered with long hairs; the legs are amply supplied with hairs, those on the third and fourth pairs being the longest and most abundant; each tarsus is terminated by three claws; the two superior ones are curved and deeply pectinated, and the inferior one is inflected near its base; the palpi are slender, and have a curved, pectinated claw at their extremity. These parts are of a dark-brown colour, faintly tinged with red; the falces, maxillæ, lip, and sternum being the darkest. The abdomen is oviform, broader at the anterior than at the posterior extremity, convex above, projecting over the base of the cephalo-thorax; it is densely covered with hairs, those on the under part being much the longest, and is of an olive-brown colour; four minute, circular depressions of a darker hue, situated on the upper part, describe a quadrilateral figure, whose anterior side is the shortest.

In colour the sexes closely resemble each other, but the male is decidedly larger than the female, and its legs are longer, an anterior one measuring an inch. The humeral joint of the palpi is curved towards the cephalo-thorax; the radial joint is longer and rather slenderer than the cubital; and the digital joint is long, slender, hairy, convex above, at the base, but cylindrical and pointed at the extremity; the palpal organs, comprised in a cavity on the under side of the basal convexity, are neither highly developed nor very complicated in structure; they have a fine spine, curved from the inner towards the outer side, near their extremity, a small, prominent process, inflected at its summit, which is directed from their

base upwards, and are of a dark, reddish-brown colour, the central and most prominent part having a pale, reddish-brown tint.

*Argyroneta aquatica* habitually passes the greater part of its life in the water, not only pursuing its prey in that liquid, but constructing beneath its surface a dome-shaped cell, in which is placed its cocoon of white silk, of a compact texture and lenticular form, containing from eighty to a hundred spherical eggs, of a yellow colour, not agglutinated together. This cell is supported in a vertical position, the open part being directed downwards, by lines of silk connecting it with aquatic plants, and as it comprises a considerable quantity of atmospheric air, the spider can at all times occupy it without experiencing the least inconvenience. In swimming and diving *Argyroneta aquatica* assumes an inverted position, and is more or less enveloped in air confined by the circumambient water among the hairs with which it is clothed, the supply being always more abundant on the under than on the upper part, in consequence of the greater length and density of the hairs distributed over its surface.

This species is found in pools and ditches in various parts of England. It is of frequent occurrence in the fens of Cambridgeshire, from which locality a pair was transported to Crumpsall Hall, near Manchester, in the summer of 1833; each individual was inclosed in a small, tin box, and neither of them appeared to suffer materially from the confinement. After a lapse of ten days, during which period they were without water, these spiders were conveyed to Oakland, in Denbighshire, where they arrived in perfect health. One of them, on being placed in a large goblet more than half filled with water, speedily formed a dome-shaped cell beneath the surface, attaching it to the side of the glass by means of numerous silken lines, and being well supplied with insects, it lived in this state of captivity till the commencement of winter, when, on the temperature of the room in which it was kept becoming much reduced, it entered the cell and remained there in a state of torpidity, with its head downwards. A gentleman on a visit at the house, whose curiosity to examine the spider minutely in its hybernaculum was greater than his prudence, inclined the glass so much that the air escaped from the cell, the water flowed in, and before information of the circumstance was given, the dormant inmate had perished.

The aquatic habits of this species have induced M. Walckenaer to constitute with it a distinct family; but upon the same principle, *Lycosa piratica* and *Dolomedes fimbriatus* might be separated from the *Lycosidæ*, as they descend spontaneously into water and perform the function of respiration in that situation precisely in the same manner as *Argyroneta aquatica* does; yet the position, which in conformity with their organization they so consistently occupy in the systematic arrangement of the *Araneidea*, has not been disturbed. Regard being had to these considerations and to the relations of affinity predominant in the structure and economy of *Argyroneta aquatica*, it has been deemed expedient to transfer it to the family *Drassidæ*.

Mr. R. Templeton states that *Argyroneta aquatica* abounds in the neighbourhood of Lurgan, in Ireland.

*Family* CINIFLONIDÆ.

All the spiders of this small family, at present known, are natives of Europe, Upper Canada, Madeira, or South America; they have the falces articulated vertically, and two branchial opercula occupy the usual situation on the inferior surface of the abdomen, which is terminated by eight spinners; those constituting the inferior pair are the shortest, and consist of a single joint each; they are united throughout their entire length, and their figure is somewhat conical, but compressed and truncated, so that the base and apex are elliptical, with long transverse axes. The tarsi are triungulate, and the metatarsus of each posterior leg is provided with a calamistrum or curling apparatus, composed of two parallel rows of short, close-set, moveable spines, employed by these spiders in the construction of their snares.

Crevices in rocks, walls, and the bark of trees, the inside of buildings, and the foliage of shrubs and plants, are the situations usually selected by the *Ciniflonidæ* for their retreats, and contiguous to them they fabricate their highly complicated and curious toils, comprising numerous tortuous filaments curled by an elaborate process, in which the calamistra perform an important part.

*Genus* CINIFLO (*Blackwall*).

*Eyes* disposed in two transverse rows on the anterior part of the cephalo-thorax; the intermediate ones of both rows are sessile, and describe a trapezoid whose anterior side is the shortest, and each lateral pair is seated obliquely on a tubercle.

*Maxillæ* long, enlarged, and rounded at the extremity, and somewhat inclined towards the lip.

*Lip* rather longer than broad, dilated about the middle, and truncated at the extremity.

*Legs* robust; the first pair is the longest, then the fourth, and the third pair is the shortest.

## CINIFLO ATROX. Pl. IX, fig. 88.

*Ciniflo atrox*, Blackw., Linn. Trans., vol. xviii, p. 607.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 98.

*Clubiona atrox*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 605.

— — Latr., Gen. Crust. et Insect., tom. i, p. 93.

— — Sund., Vet. Acad. Handl., 1831, p. 144.

— — Hahn, Die Arachn., Band i, p. 115, tab. 30, fig. 87.

*Amaurobius atrox*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 15.

— — Koch, Die Arachn., Band x, p. 116, tab. 355, fig. 831.

*Titulus* 21, Lister, Hist. Animal. Angl., De Aran., p. 68, tab. i, fig. 21.

Length of the female,  $\frac{3}{8}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{6}$ th, breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{1}{6}$ th; length of an anterior leg,  $\frac{7}{16}$ ths; length of a leg of the third pair,  $\frac{1}{3}$ rd.

The cephalo-thorax is rounded on the sides, compressed before, convex, glossy, thinly clothed with hairs, depressed and broadly truncated in front, and marked with furrows on the sides, which converge towards the middle; its colour is reddish-brown, the anterior part, which is much the darkest, in some specimens approaching to black. The falces are powerful, conical, vertical, gibbous in front, near the base, armed with a few teeth on the inner surface, and of a brownish-black colour. The sternum is somewhat oval, but pointed at its posterior extremity; this part, with the maxillæ and lip, is of a reddish-brown hue, the lip being the darkest, and the sternum the palest. The legs are robust, provided with hairs and strong spines, of a pale, reddish-brown tint, the tarsi being the darkest, and are marked with soot-coloured annuli; the inferior tarsal claw has a fine, curved tooth on each side, near its base. The palpi resemble the legs in colour, but are without annuli; they have a curved, pectinated claw at their extremity. The abdomen is oviform, rather broader at the posterior than at the anterior extremity, convex above, hairy, projecting over the base of the cephalo-thorax; it is of a dark-brown colour, with a large, quadrilateral, black band, bordered laterally and posteriorly with pale-yellow, extending from the anterior extremity nearly to the middle of the upper part; the posterior part of the black band is the broadest, and its margins, which present an irregular outline, are the darkest; between the black band and the spinners there is a series of rather obscure, yellowish, angular lines, whose vertices are directed forwards, and the sides and under part are thickly spotted and streaked with black; the spinners have a dull-yellowish tint; a broad, glossy, dark, red-brown septum separates the orifices of the sexual organs, and the colour of the branchial opercula is pale-yellow.

The male is smaller than the female, the anterior part of its cephalo-thorax is lighter coloured, and its legs, which are longer and slenderer, differ also in their relative length, the second pair equaling or even slightly surpassing the fourth pair in longitudinal extent. The cubital and radial joints of the palpi are short, the latter, which is the larger, being provided

with several apophyses; one situated in front, towards the inner side, is slightly curved and somewhat pointed; another, on the outer side, is straight and rounded at the extremity; and between these two there is a short projection, having two processes, one obtuse and the other pointed; underneath, the extremity of the joint is bifid; the digital joint is somewhat oval, with a prominent lobe on the outer side, and a bold protuberance at the upper part, near its articulation with the radial joint; it is convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, complicated in structure, with a strong, curved process and some delicate, white membrane at their extremity, and a large, prominent part, contiguous to which there is a small, curved process, situated near the middle; their colour is red-brown.

Remarkable differences in structure, functions, and economy effectually serve to distinguish the spiders belonging to the genus *Ciniflo* from those of the genera *Clubiona* and *Amaurobius*, with which they have been associated by arachnologists; all of them have an additional or *fourth* pair of spinners, and on the superior part of the metatarsus of each posterior leg there is a *calamistrum*, consisting of two parallel rows of moveable spines, which is employed in the fabrication of their extensive and curiously constructed webs; they are also sedentary in their habits, most frequently occupying crevices in rocks, walls, or the bark of old trees, between which and their snares a communication is effected through the medium of one or more slight, silken tubes. Though the importance of these characters is admitted by M. Walckenaer, yet he still retains the species of *Ciniflo* among the *Clubionæ* ('Hist. Nat. des Insect. Apt.,' tom. iv, pp. 444, 445).

The female of this common spider in the month of June deposits about seventy spherical eggs, of a pale-yellow colour, not agglutinated together, in a cocoon of white silk of a loose texture, measuring seven twenty-fourths of an inch in diameter; it is nearly of a plano-convex figure, and is connected with the interior surface of an oval cell of white, curled silk, on the outside of which bits of soil and other extraneous materials are distributed. This cell is generally constructed in or near the spider's retreat.

On the 14th of September, 1842, an adult female of this species was captured, in which the left intermediate eye of the posterior row was entirely wanting.

The dimensions of *Clubiona* (*Ciniflo*) *atrox* given by M. Hahn ('Die Arachn.,' Band i, p. 115) have, most probably, been taken from *Ciniflo similis* or from *Ciniflo ferox*.

This species is of frequent occurrence in Scotland and Ireland.

#### CINIFLO SIMILIS. Pl. IX, fig. 89.

*Ciniflo ferox*, Blackw., Linn. Trans., vol. xix, p. 116.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 99.

Length of the female,  $\frac{11}{20}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{5}$ th, breadth,  $\frac{1}{6}$ th; breadth of the abdomen,  $\frac{1}{4}$ th; length of an anterior leg,  $\frac{13}{20}$ ths; length of a leg of the third pair,  $\frac{1}{2}$ .



This spider bears a close resemblance to *Ciniflo atrox*, but it is larger and darker-coloured than that species, from which it differs also in having an obscure, longitudinal band, of a dull-yellowish colour, extending from the anterior part of the upper side of the abdomen towards its middle; this band is encompassed by an irregular, black line, which is broadest at its posterior extremity, and is bordered laterally and posteriorly with pale-yellow; the sides and under part are sometimes marked with minute, whitish spots, those on the latter forming four longitudinal rows; and the sexual organs are smaller proportionally and less conspicuous than those of *Ciniflo atrox*. The inferior tarsal claw is provided with a fine, curved tooth on each side, near its base.

The male is smaller than the female, the cephalic region is paler, and the legs are not only longer and slenderer, but their relative length is different, the second pair surpassing the fourth. The palpi and palpal organs are similar in structure to those of the male of *Ciniflo atrox*, but the apophysis connected with the radial joint in front, towards the inner side, is much more slender, curved, and pointed; and the small, curved process near the middle of the palpal organs, which are darker coloured and proportionally less developed, is not so contiguous to the large, protuberant part, which is situated nearer to the inner side and is more prominent at its extremity. Notwithstanding the superior size of this spider, it is very commonly confounded with *Ciniflo atrox*, to which it makes a near approximation in form, colour, and economy; both species are found in the same localities, and are abundantly distributed throughout the kingdom.

CINIFLO FEROX. Pl. IX, fig. 90.

*Clubiona ferox*, Walck., Hist. Nat. des Insect. Apt., tom. i, p. 606.

*Amaurobius ferox*, Koch, Die Arachn., Band vi, p. 41, tab. 191, figs. 460, 461.

Length of the female,  $\frac{11}{24}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{4}$ th, breadth,  $\frac{1}{7}$ th; breadth of the abdomen,  $\frac{3}{16}$ ths; length of an anterior leg,  $\frac{2}{3}$ rds; length of a leg of the third pair,  $\frac{1}{2}$ .

The eyes are pellucid, and are disposed on the anterior part of the cephalo-thorax in two transverse rows, the anterior row being situated immediately above the frontal margin; the four intermediate eyes form a trapezoid whose anterior side is the shortest, and those of each lateral pair, which are the largest, are seated obliquely on a tubercle. The cephalo-thorax is large, convex, glossy, compressed before, rounded on the sides, which are marked with furrows converging towards an indentation in the medial line, and somewhat depressed and rounded in front; it is sparingly clothed with fine hairs, and of a yellowish-brown colour, the anterior part and the lateral furrows being much the darkest. The falces are powerful, conical, vertical, convex in front, near the base, armed with teeth on the inner surface, and have a brown-black hue. The maxillæ are enlarged and rounded at the extremity, and slightly inclined towards the lip, which is longer than broad, dilated about the middle, and truncated

at the apex. These organs are of a reddish-brown colour, the lip being the darkest. The sternum is heart-shaped, thinly clothed with long, black hairs, glossy, and of a pale, yellowish-brown colour. The legs are robust, provided with hairs and sessile spines, and have a yellowish-brown hue, with obscure, soot-coloured annuli; the coxæ and femora are much the palest, and the metatarsi and tarsi are sometimes tinged with red; each tarsus is terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base, on each side of which there is a fine tooth. The palpi resemble the legs in colour, but are without annuli, and the digital joint, which is the darkest, has a curved, pectinated claw at its extremity. The abdomen is oviform, hairy, convex above, and projects over the base of the cephalo-thorax; it is of a brownish-black colour, freckled with yellowish-white; three large, yellowish-white bands extend from the anterior extremity of the upper part more than a third of its length; the intermediate one terminates in a point, and the lateral ones are enlarged and curved inwards at the extremity; these bands are succeeded by a series of four oblique, yellowish-white spots on each side of the medial line; they are disposed in pairs, and diminish in size as they approach the spinners, which have a brown hue, with yellowish-white extremities; on the under part there are four longitudinal, yellowish-white lines; the two intermediate ones, which are composed of confluent spots, are the least conspicuous, and near to each other; the sexual organs are well developed, and of a very dark, reddish-brown colour, that of the branchial opercula being yellowish-white.

The male, though somewhat smaller than the female, resembles her in the design formed by the distribution of its colours, and in the relative length of its legs, but their absolute length is greater. Its palpi have a pale, brownish-yellow hue, the digital joint being the darkest: the cubital and radial joints are short, and the latter, which is the larger, and bifid at its extremity, underneath, has two conspicuous apophyses in front; one, situated towards the outer side, is straight, and has its extremity somewhat enlarged, and prominent at the outer side; the other, situated towards the inner side, is large, and terminates in a short, slightly curved point; underneath it has a prominent, semicircular, dark, red-brown margin, the inner side of which is notched or emarginated; the digital joint is somewhat oval, with a prominent lobe on the outer side, and a protuberance at its base; it is convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, complicated in structure, very protuberant and convex at the base and outer side, and terminate in two curved processes, one of which, more curved, pointed, and prominent than the other, has its extremity in contact with some delicate, white membrane; near the middle there is a short, curved, protuberant process, which has a prominence at its base, both on the outer and inner side; the colour of these organs is red-brown and yellowish-white intermixed, the outer side of the convex, protuberant part being almost white.

This species varies greatly in colour, some individuals being much darker than others.

The Rev. O. P. Cambridge has found *Ciniflo ferox* abundant in Portland, under stones and fragments of rock; and Mr. R. H. Meade has taken it in Buckinghamshire, and in cellars and neglected buildings in Bradford.

CINIFLO MORDAX. Pl. IX, fig. 91.

*Ciniflo mordax*, Blackw., Annals and Mag. of Nat. Hist., third series, vol. iii, p. 93.

Length of the female,  $\frac{3}{4}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{4}$ th, breadth,  $\frac{1}{6}$ th; breadth of the abdomen,  $\frac{1}{4}$ th; length of an anterior leg,  $\frac{17}{24}$ ths; length of a leg of the third pair,  $\frac{13}{24}$ ths.

The eyes are disposed on the anterior part of the cephalo-thorax in two transverse rows; the anterior row, which is straight, is situated near the frontal margin, and the posterior row is slightly curved, with its convexity directed backwards; the intermediate eyes of both rows describe a trapezoid whose anterior side is the shortest; and the eyes of each lateral pair, which are rather the largest of the eight, are seated obliquely on a tubercle. The cephalo-thorax is large, convex, glossy, compressed before, and rounded on the sides, which are marked with furrows converging towards an elongated indentation in the medial line; it is depressed, and broadly truncated in front, and of a red-brown colour; the cephalic region, which is much the darkest, having a brownish-black hue. The falces are very powerful, conical, vertical, convex in front, near the base, armed with teeth on the inner surface, and of a brownish-black hue. The maxillæ are strong, enlarged and rounded at the extremity, and somewhat curved towards the lip; the lip is longer than broad, dilated about the middle, and truncated at the apex; and the sternum is oval and glossy. These parts have a red-brown hue, the sternum being much the palest, particularly in the middle. The legs are robust, provided with hairs and sessile spines, and of a red-brown colour; the metatarsi of the posterior pair are provided with calamistra on their superior surface, and each tarsus is terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base; the first pair is the longest, then the fourth, and the third pair is the shortest. The palpi resemble the legs in colour, the radial and digital joints being the darkest, and have a curved, pectinated claw at their extremity. The abdomen is oviform, convex above, and projects over the base of the cephalo-thorax; it is thinly clothed with hairs, and of a brown colour, obscurely freckled with yellowish-white, the under part being the palest; a yellowish-white band extends along the middle of the upper part, about two thirds of its length, and an obscure, longitudinal line of the same hue occurs on each side of the middle of the under part; the sexual organs are highly developed, and of a dark, reddish-brown colour; the spinners are eight in number, and, with the exception of those of the inferior pair, which are united throughout their entire length, and have a yellowish-white hue, are of a red-brown colour.

This spider was captured in the Isle of Wight, on the 1st of August, 1858, by Frederick Bond, Esq., who gave it to the Rev. O. P. Cambridge, from whom it was received.

CINIFLO HUMILIS. Pl. IX, fig. 92.

*Ciniflo humilis*, Blackw., Annals and Mag. of Nat. Hist., second series, vol. xvi,  
p. 120.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xx,  
p. 499.

Length of the female,  $\frac{1}{10}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{33}$ th, breadth,  $\frac{1}{30}$ th; breadth of the abdomen,  $\frac{1}{18}$ th; length of an anterior leg,  $\frac{1}{8}$ th; length of a leg of the third pair,  $\frac{1}{11}$ th.

The four intermediate eyes describe a trapezoid, the two anterior ones, which form its shortest side, being much the smallest and darkest of the eight. The cephalo-thorax is convex, glossy, compressed before, rounded on the sides, and has an indentation in the medial line; it is of a brown colour, with longitudinal lines in the cephalic region, oblique streaks on the sides, and lateral margins of a brownish-black hue. The falces are conical, vertical, armed with a few teeth on the inner surface, and, with the maxillæ, which are enlarged at the extremity, and slightly inclined towards the lip, have a pale-brown hue. The lip is dilated about the middle, and truncated at the apex; and the sternum is heart-shaped. These parts are of a dark-brown colour, the former being paler at the extremity. The legs are moderately long, provided with hairs, and of a yellowish-brown hue, with brownish-black annuli; each tarsus is terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base. The palpi resemble the legs in colour, but are without annuli. The abdomen is oviform, thinly clothed with hairs, convex above, and projects over the base of the cephalo-thorax; it is of a pale, yellowish-brown colour, with a series of angular lines of a brownish-black hue, whose vertices are directed forwards, and whose extremities are enlarged, extending along the middle of the upper part; this series of angles is bisected by a brownish-black, longitudinal line, which is enlarged and somewhat triangular at its anterior extremity; the sides are closely reticulated with brown lines; two brown bands extend along the under part to a transverse bar of the same hue, near the spinners; and the sexual organs are of a red-brown colour.

A specimen of this small species of *Ciniflo*, which is provided with eight spinners and calamistra, was captured by Mr. R. H. Meade in Buckinghamshire, in August, 1854; two adult females have also been received from the Rev. Hamlet Clark, who took them in Northamptonshire.

*Genus* ERGATIS (*Blackwall*).

*Eyes* nearly equal in size, disposed on the anterior part of the cephalo-thorax in two transverse rows; the intermediate ones of both rows form a square, and those of each lateral pair are placed obliquely on a tubercle near to each other.

*Maxillæ* convex at the base, somewhat dilated near the middle, rounded at the extremity, which is more abruptly curved on the inner than on the outer side, and inclined towards the lip.

*Lip* large, triangular, acute, or rounded at the apex.

*Legs* rather short; the first pair is the longest, then the second, and the third pair is the shortest.

## ERGATIS BENIGNA. Pl. IX, fig. 93.

*Ergatis benigna*, Blackw., Linn. Trans., vol. xviii, p. 608.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 99.

*Theridion benignum*, Walck., Hist. Nat. des Insect. Apt., tom. ii, p. 337.

— — Sund., Vet. Acad. Handl., 1831, p. 122.

*Dictyna benigna*, Sund., Consp. Arachn., p. 16.

— — Koch, Die Arachn., Band iii, p. 27, tab. 83, figs. 184, 185.

— — Koch, Uebers. des Arachn. Syst., erstes Heft, p. 12.

*Clubiona parvula*, Blackw., Lond. and Edinb. Phil. Mag., third series, vol. iii, p. 437.

*Drassus parvulus*, Blackw., Research. in Zool., p. 337.

*Titulus* 15, Lister, Hist. Animal. Angl., De Aran., p. 55.

Length of the female,  $\frac{3}{20}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{14}$ th, breadth,  $\frac{1}{20}$ th; breadth of the abdomen,  $\frac{1}{11}$ th; length of an anterior leg,  $\frac{1}{5}$ th; length of a leg of the third pair,  $\frac{1}{8}$ th.

The cephalo-thorax is compressed before, very convex in the cephalic region, but depressed and rounded in front; the sides and posterior part are depressed, the former being marked with furrows, which converge towards the middle; it is of a very dark-brown colour, with five lines of white hairs on the anterior convexity, which unite at their extremities; the space below the eyes and the base of the falces are also supplied with white hairs. The falces are powerful, conical, vertical, and armed with a few teeth on the inner surface; the maxillæ are strong, and inclined towards the lip, which is rounded at the apex; the sternum



is heart-shaped. These parts are of a very dark-brown colour, the sternum being thinly covered with whitish hairs. The legs and palpi are robust, and of a brown hue; the two superior tarsal claws are curved and pectinated, and the inferior one is inflected near its base. The abdomen is oviform, clothed with short hairs, convex above, projecting over the base of the cephalo-thorax; along the middle of the upper part a broad, dentated, dark-brown band extends, which is generally bisected by an irregular, transverse, white line, between which and the spinners there is a series of obscure, angular lines, of a pale-brown or whitish colour, whose vertices are directed forwards; a deep border, of a dull-white hue, which becomes narrower as it approaches the spinners, encompasses the dark-brown band; the sides are of a dark-brown colour, mottled with white; the under part has a dull-white hue, a broad, dark-brown band, marked with a few white spots, occupying the medial line; and the colour of the branchial opercula is brown.

The male is smaller and darker coloured than the female, and its falces, which are longer, have a large prominence on the under side, and a minute one in front, near their articulation; they are hollowed about the middle of the inner surface, leaving a strong prominence near the extremity, on the lower part of which a few small teeth are situated, and they are curved a little forwards at the end. The cubital and radial joints of the palpi are short; the former is the stronger, and the latter has a small, pointed process projecting at right angles from the upper part, in front, and an obtuse apophysis at its extremity, on the outer side; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs; they are highly developed, have a strong, corneous process curving from below upwards, and terminating in a spiral point, which extends nearly to the articulation of the radial with the cubital joint, and are of a reddish-brown colour.

The various places which arachnologists have assigned to the spiders constituting the genus *Ergatis*, in their attempts to arrange the *Araneidea* in accordance with the natural relations of affinity and analogy, afford a sufficient indication that the task of determining their true position, before the discovery of those marked characters which serve to connect them with the *Ciniflonidæ*, was attended by no ordinary difficulties. M. Walckenaer, in his 'Hist. Nat. des Insect. Apt.,' t. iv, p. 500), has formed, with the species belonging to the genus *Ergatis*, previously included by him in the genera *Drassus* and *Theridion*, a small group which he has placed at the head of his genus *Argus*; but so closely are they allied to the *Ciniflones* by their structure and functions, being provided with *eight* spinners and *calamistra*, employed in the construction of their snares, that they cannot be removed from the family *Ciniflonidæ*, which is founded upon those characters, without doing violence to the recognised principles of classification.

*Ergatis benigna* fabricates an irregular web of whitish silk at the extremity of the twigs of heath and gorse growing in various parts of England, Wales, and Scotland. It pairs in May, and in that and the succeeding month the female constructs two or three contiguous, lenticular, white cocoons, of a compact texture, measuring about one seventh of an inch in diameter, on an average, which she attaches to the stems surrounded by her web, enveloping them with the refuse of her prey. Each cocoon contains from ten to thirty spherical eggs, of a pale-yellow colour, which do not adhere together.

ERGATIS PALLENS. Pl. X, fig. 94.

*Ergatis pallens*, Blackw., Annals and Mag. of Nat. Hist., third series, vol. iii, p. 94.

Length of the female,  $\frac{1}{8}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{20}$ th, breadth,  $\frac{1}{24}$ th; breadth of the abdomen,  $\frac{1}{16}$ th; length of an anterior leg,  $\frac{1}{8}$ th; length of a leg of the third pair,  $\frac{1}{8}$ th.

The legs and palpi are moderately long, provided with hairs, and of a pale, dull-yellow hue. The legs of the first pair are the longest, then those of the second pair, and the posterior legs, which have a calamistrum on the superior surface of their metatarsi, are longer than those of the third pair; each tarsus is terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base. The cephalo-thorax is compressed before, depressed and rounded on the sides, which are marked with furrows converging towards the middle, and the cephalic region is convex and rounded in front; it is of a dark-brown colour, with a broad, yellowish-brown band, which tapers to its posterior extremity, and is densely covered with yellowish-gray hairs, extending from the eyes along the middle, nearly two thirds of its length, and a dentated, yellowish-white band on each lateral margin. The eyes are nearly equal in size, and the four intermediate ones form a square. The falces are powerful, conical, and vertical; the maxillæ are convex at the base, somewhat dilated near the middle, rounded at the extremity, which is more abruptly curved on the inner than on the outer side, and inclined towards the lip, which is large, triangular, and rounded at the apex; and the sternum is heart-shaped. These parts are of a reddish-brown colour, the sternum and lip being the darkest, and the falces much the palest. The abdomen is oviform, convex above, and projects over the base of the cephalo-thorax; it is clothed with short hairs, and is of a grayish-yellow colour; in the medial line of the upper part there is a dark, red-brown spot, nearly of a circular form, situated full one third of its length from its anterior extremity; and at the posterior extremity a few short, curved, transverse bars of the same hue occur, which diminish in length as they approach the spinners; a few obscure, dark-brown streaks and spots are disposed along the sides, and a broad, longitudinal band, of the same colour, occupies the middle of the under part; the spinners are eight in number, and the two inferior ones are united throughout their entire length.

This *Ergatis* was taken among heath at Lyndhurst, in the New Forest, by the Rev. O. P. Cambridge, in September, 1858.

ERGATIS LATENS. Pl. IX, fig. 95.

*Ergatis latens*, Blackw., Linn. Trans., vol. xviii, p. 608.

— — Blackw., Linn. Trans., vol. xix, p. 117.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 100.

*Dictyna latens*, Koch, Die Arachn., Band iii, p. 29, tab. 83, fig. 186.

*Theridion latens*, Walck., Hist. Nat. des Insect. Apt., tom. ii, p. 340.

*Titulus* 16, Lister, Hist. Animal. Angl., De Aran., p. 56, tab. i, fig. 16.

Length of the female,  $\frac{1}{8}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{20}$ th, breadth,  $\frac{1}{24}$ th; breadth of the abdomen,  $\frac{1}{12}$ th; length of an anterior leg,  $\frac{1}{7}$ th; length of a leg of the third pair,  $\frac{1}{10}$ th.

The cephalo-thorax is compressed before, very convex in the cephalic region, but depressed and rounded in front; the sides and posterior part are depressed, the former being marked with furrows which converge towards the middle; its colour is very dark-brown, the cephalic convexity being thinly covered with white hairs. The falces are powerful, conical, vertical, and armed with a few teeth on the inner surface; the maxillæ are strong, and inclined towards the lip, which is rounded at the apex; the sternum is heart-shaped. These parts are of a very dark-brown colour, the sternum being covered with coarse, white hairs. The legs and palpi are rather short, and their colour is dark-brown; the two superior tarsal claws are curved and pectinated, and the inferior one is inflected near its base. The abdomen is oviform, convex above, projecting over the base of the cephalo-thorax; it is covered with short hairs, and of a gray colour, with a broad, dentated, black band extending along the middle of the upper part, which tapers to the extremities, and has some narrow, transverse, grayish lines on its posterior half; a plain, broad band of a similar colour, but rather paler, occupies the middle of the under part, and the sides have a blackish hue; the colour of the branchial opercula is brown.

In colour, and in the relative length of its legs, the male resembles the female, but it is smaller, and its falces, which are longer, have a large prominence on the under side, and a minute one in front, near their articulation; they are hollowed about the middle of the inner surface, leaving a strong prominence near the extremity, on the lower part of which a few small teeth are situated, and they are curved a little forwards at the end. The palpi and palpal organs are precisely similar in structure to those of the male of *Ergatis benigna*.

This species is found in the same localities as *Ergatis benigna*, which it resembles in habits and economy. The sexes pair in June, and in the following month the female constructs several contiguous, lenticular cocoons of greenish-white silk, of a compact texture, measuring about one eighth of an inch in diameter, on an average; these she attaches to a stem of gorse or heath, surrounded by her web, distributing about them the refuse of her prey; each contains from ten to sixteen spherical eggs, of a yellow colour, which are not adherent among themselves.

The statement of M. Walckenaer, that this spider has the fourth pair of legs longer than the second ('Hist. Nat. des Insect. Apt.,' tom. iv, p. 501), requires correction, as the relative length of its organs of locomotion does not differ from that of its congeners, *Ergatis benigna* and *Ergatis pallens*.

Genus VELEDA (*Blackwall*).

*Eyes* small, nearly equal in size, disposed on the anterior part of the cephalo-thorax in two transverse, curved rows, whose convexity is directed forwards; the anterior row, which is the less curved, is situated near the frontal margin, and the intermediate eyes, which are seated on a tubercle, are the largest, and the lateral ones rather the smallest of the eight; the lateral eyes of both rows are widely apart, and are placed on minute tubercles, and the intermediate ones form a trapezoid, whose anterior side is the shortest.

*Maxillæ* moderately long, straight, powerful, greatly enlarged, and rounded at the extremity, which is prominent on the inner surface.

*Lip* short, triangular, and rounded at the apex.

*Legs* very unequal in length; the first pair is much the longest, then the fourth, and the third pair is the shortest; each metatarsus of the posterior pair is provided with a calamistrum situated on its superior surface.

*Spinners* eight; those constituting the inferior pair are united throughout their entire length.

VELEDA LINEATA. Pl. X, fig. 96.

*Veleda lineata*, Blackw., Annals and Mag. of Nat. Hist., third series, vol. iii, p. 96.

Length of the female,  $\frac{3}{8}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{16}$ th, breadth,  $\frac{1}{24}$ th; breadth of the abdomen,  $\frac{1}{16}$ th; length of an anterior leg,  $\frac{1}{4}$ th; length of a leg of the third pair,  $\frac{1}{12}$ th.

The abdomen is of an oblong-oviform figure, convex above, and projects over the base of the cephalo-thorax; the anterior extremity and the posterior part of each side are densely covered with white hairs; the upper part is of a brownish-yellow colour, with three longitudinal, dark-brown lines, whose posterior half is somewhat ramified, extending its entire length; one of these lines, which is broadest towards its anterior extremity, occurs in the middle, and another is situated on each side of it; the anterior and part of the superior

region of the sides, extending towards the spinners, and the under part, are of a brownish-black colour. The cephalo-thorax is long, moderately convex, compressed before, depressed and rounded on the sides, and clothed with white hairs; it is of a brown-black colour, with three longitudinal, brownish-yellow lines, one in the middle, and another on each side, and narrow lateral margins of the same hue. The falces are short, conical, vertical, and of a yellowish-brown colour. The maxillæ and lip have a dark-brown hue, the apex of the latter being much the palest. The sternum is of an oblong-oval form; it is thinly clothed with white hairs, and has a brownish-black hue. The legs are hairy, and the inferior surface of the tarsus and of the extremity of the metatarsus of the posterior pair is provided with short spines; they are of a yellowish-brown colour, with dark-brown streaks and annuli. The palpi are short, and resemble the legs in colour, that of the digital joint being dark-brown.

Four specimens of this remarkable spider, taken by the Rev. O. P. Cambridge, among heath, at Lyndhurst, in the New Forest, in September, 1858, were all immature; independently, however, of this circumstance, the species presents such marked differences in external structure from the spiders belonging to the several genera included in the family *Cixiiflonidæ*, that the expediency of founding a new genus upon it cannot admit of a doubt. Possessing many characteristics in common with the spiders of the genus *Uloborus*, it might have been placed among them had it not been provided with a fourth pair of spinners and calamistra, which must exercise an important influence upon its economy.

M. Walckenaer states, on the authority of M. Dufour ('Hist. Nat. des Insect. Apt.,' tom. ii, p. 229), that the snare of *Uloborus Walckenaerius* is constructed on the same plan as those of the *Epëiridæ*, from which circumstance it may be inferred that it has not the additional pair of spinners and calamistra, as the snares of all spiders provided with this apparatus, whose economy is known, exhibit unmistakeable evidence of its having been employed in their fabrication.



*Family AGELENIDÆ.*

No continent on the face of the globe is without representatives of the *Agelenidæ*, which have the falces articulated vertically or on an inclined plane. Their abdomen is provided with three pairs of spinners and with two branchial opercula, and the tarsi are usually terminated by three, rarely by two, claws.

Bushes and coarse herbage, crevices in rocks and walls, holes in the earth, the under-side of stones, and the inside of buildings, are the situations most commonly occupied by the spiders of this family. For the purpose of insnaring their prey they construct a sheet of web, varying in extent, and having, in numerous instances, a tube connected with it, which either leads to or constitutes the retreat of the spider. This web is attached to objects in its vicinity by its margin, and frequently derives additional support from fine lines, intersecting one another at various angles, whose extremities are in contact with its surface and with objects situated above and below it.

*Genus AGELENA, Walckenaer.*

*Eyes* disposed on the anterior part of the cephalo-thorax in two transverse, curved rows, whose convexity is directed backwards; they do not present any very remarkable difference in size.

*Maxillæ* short, powerful, somewhat oval or quadrate.

*Lip* large, nearly quadrate, or inclined to oval.

*Legs* moderately long; the fourth pair is the longest, then the first, and the third pair is the shortest.

*AGELENA LABYRINTHICA. Pl. X, fig. 97.*

<i>Agelena labyrinthica</i> ,	Walck.,	Hist. Nat. des Insect. Apt., tom. ii, p. 20.
—	—	Sund., Vet. Acad. Handl., 1831, p. 129.
—	—	Hahn, Die Arachn., Band ii, p. 61, tab. 65, figs. 150, 151.
—	—	Koch, Uebers. des Arachn. Syst., erstes Heft, p. 14.
—	—	Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 100.
<i>Aranea</i>	—	Latr., Gen. Crust. et Insect., tom. i, p. 95.
<i>Titulus</i> 18,		Lister, Hist. Animal. Angl., De Aran., p. 60, tab. i, fig. 18.

Length of the female,  $\frac{1}{2}$  an inch; length of the cephalo-thorax,  $\frac{1}{3}$ th, breadth,  $\frac{1}{7}$ th; breadth of the abdomen,  $\frac{1}{5}$ th; length of a posterior leg,  $\frac{1}{3}$ ths; length of a leg of the third pair,  $\frac{1}{10}$ ths.

The eyes are almost equal in size; the four intermediate ones form a square nearly, the anterior pair being rather the largest of the eight, and the eyes of each lateral pair are seated obliquely on a small tubercle, but are not contiguous. The cephalo-thorax is convex, hairy, compressed before, and rounded on the sides, which are marked with furrows converging towards an elongated indentation in the medial line; it is of a reddish-brown hue, with a broad, longitudinal band on each side, and lateral margins of a dark-brown colour; the reddish-brown spaces are usually covered with yellowish-brown hairs, and form a broad band extending along the middle, and another immediately above each lateral margin. The falces are powerful, conical, vertical, and armed with two rows of teeth on the inner surface; the maxillæ are short, straight, and increase in breadth from the base to the extremity, which is rounded and fringed with long hairs on the inner side; the lip is somewhat quadrate, being rather broader at the base than at the extremity; and the sternum is heart-shaped. These parts are of a reddish-brown colour, the maxillæ being much the palest. The legs are robust, provided with hairs and spines, and are of a reddish-brown hue, the extremities being the darkest; a faint tinge of green occurs on the thighs, and the tibiæ and tarsi are marked with a few dark-brown annuli; each tarsus is terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base, on each side of which there are two or three fine teeth. The palpi resemble the legs in colour, but are without annuli, and have a curved, pectinated claw at their extremity. The abdomen is oviform, hairy, convex above, projecting over the base of the cephalo-thorax; it is of a dark-brown tint on the upper part, with a series of fine, angular, yellowish-brown lines extending along the middle; their vertices, which are directed forwards, are obliterated at the anterior part of the series by a longitudinal band of a yellowish-brown hue, and immediately above the spinners there is a spot of the same colour; the sides are of a dark-brown hue, mottled with yellowish-brown, and the under part, which is of a yellowish-brown colour, has a broad, longitudinal, dark-brown band on each side, comprising a yellowish-brown line; the superior spinners are long, triarticulate, and of a dark, reddish-brown hue, with the spinning tubes distributed on the inferior surface of the terminal joint; the sexual organs present a red-brown orifice bisected by a longitudinal septum, and surrounded by a very dark, reddish-brown margin, which is most prominent at its posterior part; the colour of the branchial opercula is yellow. This species has numerous compound, sessile hairs on its body and limbs.

The male is smaller and slenderer than the female, but it resembles her in colour. The palpi are short, and have a red-brown tint, with the exception of the digital joint, which is of a dark-brown hue, tinged with red, particularly at the extremity; the cubital and radial joints are short; the former projects a strong, brownish-black apophysis from its extremity, on the outer side, and the latter, which is rather the shorter, has at its extremity, on the under side, a longer and more pointed apophysis of a reddish-brown colour, which is protuberant at its base, and has a small process on the outer side; the digital joint is oval, pointed at the extremity, convex and hairy externally, concave within, comprising the palpal organs. These

organs are highly developed, complicated in structure, prominent at the extremity, with a curved, pointed, red-brown process situated at the base of the most prominent part, on its outer side, and their prevailing colour is very dark, reddish-brown, approaching to black.

In localities suited to its habits, this active spider is frequently very numerous, constructing among gorse, heath, and coarse herbage an extensive, horizontal sheet of web, having a cylindrical tube connected with it, which constitutes the abode of its possessor. The web is attached to surrounding objects by its margin, and derives additional support from fine lines, intersecting one another at various angles, whose extremities are in contact with its surface and with such objects as are situated at a moderate elevation above it. The sexes pair in July, and in August the female fabricates a large sac of compact, white silk, which comprises one or two lenticular cocoons, composed of white silk of a fine texture, measuring about  $\frac{7}{16}$ ths of an inch in diameter, on an average. Each cocoon, according to its size, contains from 50 to 120 large, spherical eggs, of a pale-yellow colour, not agglutinated together, and is enveloped in a lenticular covering of strong, white silk, which is made secure to the inner surface of the sac by silken lines closely compacted in the form of short, strong pillars, evidently alluded to by Lister in the following passage: "Ipse autem folliculus *stellæ* in modum formatus est" ('De Araneis,' p. 62). This sac is firmly attached to stems of gorse, heath, or long grass, and has usually withered leaves, particles of soil, and other materials of various kinds distributed over its surface.

Mr. R. Templeton has detected this species in Ireland.

In the 'Report of the Third Meeting of the British Association for the Advancement of Science, held at Cambridge, in 1833,' p. 445, the fact is enunciated that the superior spinners of *Agelena labyrinthica* and some other spiders have the spinning-tubes disposed on the inferior surface of the elongated terminal joint, and consequently, that the opinion previously entertained, that the function exercised by these organs is simply that of touch, and that they are employed solely in regulating the application of the spinners to appropriate objects, is decidedly erroneous.

AGELENA HYNDMANII. Pl. X, fig. 98.

*Agelena Hyndmanii*, Templeton, MS. History of Irish Arachnida.

Length of the female,  $\frac{3}{8}$ th of an inch.

The intermediate eyes of the anterior row are the smallest of the eight. The cephalothorax is rectangular anteriorly, and circular posteriorly; it is of a brownish-green colour, the cephalic region being much darker; an abbreviated, dark line, forked before, occurs in the middle, whence other lines proceed towards the origins of the legs, but terminate abruptly before they reach the margin; underneath it is of a greenish-brown colour, with dark edges. The abdomen is ovate, of a very deep-green hue, with a dentated, central, pale fascia, extending along the upper part, and receiving at its base a dark-green or black, lance-shaped macula; underneath it is of a grass-green hue. The legs are spiny, hairy, and of a greenish-brown colour, with darker annuli; the fourth pair is the longest, then the first, and the third

pair is the shortest. Sometimes this species has the abdominal fascia brown, and the sides jet-black.

Mr. G. C. Hyndman detected a specimen of this *Agelena* among grass at Cranmore.

AGELENA ELEGANS. Pl. X, fig. 99.

*Agelena elegans*, Blackw., Linn. Trans., vol. xviii, p. 619.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 101.

— — Walck., Hist. Nat. des Insect. Apt., tom. iv, p. 463.

*Hahnia pratensis*, Koch, Die Arachn., Band viii, p. 64, tab. 270, fig. 639.

Length of the female,  $\frac{1}{8}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{16}$ th, breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{1}{16}$ th; length of a posterior leg,  $\frac{1}{8}$ th; length of a leg of the third pair,  $\frac{1}{7}$ th.

The cephalo-thorax is compressed before, rounded on the sides, which are depressed and marked with furrows converging towards an indentation in the middle, and there is a row of long hairs, directed forwards, in the medial line; the falcæ are strong, conical, armed with a few very minute teeth on the inner surface, and inclined towards the sternum, which is broad and heart-shaped; the maxillæ are short, gibbous at the base, and slightly inclined towards the lip, which is nearly quadrate, being rather broader at the base than at the extremity; the fourth pair of legs is the longest, and the other pairs are almost equal in length. These parts and the palpi are glossy, and of a yellowish-red colour, the base of the lip being the darkest. Each tarsus is terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base; and the palpi have a curved claw at their extremity. The intermediate eyes of the anterior row are the largest of the eight. The abdomen is short, broad, thickly covered with hairs, somewhat larger at the posterior than at the anterior extremity, convex above, projecting over the base of the cephalo-thorax; its colour is very dark-brown, approaching to black, the under part being the palest; along the middle of the upper part a series of very obscure, angular lines of a lighter hue extends, whose vertices are directed forwards; and on each side of the anterior part, near its union with the cephalo-thorax, there is a blackish spot of an oval form; the colour of the spinners is yellowish-red; they are arranged in a transverse row immediately below the anus, and the exterior ones, which are the longest, are triarticulate and have the spinning-tubes disposed on the inferior surface of the terminal joint; the branchial opercula have a yellowish-white tint.

The male is smaller than the female, but it resembles her in colour. The humeral joint of the palpi has a curved, pointed, yellowish-red process on the under side, near the middle; the cubital and radial joints are short; the former is much the larger, very gibbous above, and has a small, pointed, blackish apophysis near its extremity, on the outer side; the latter

has a strong, blackish apophysis at its extremity, on the under side, which is directed upwards, its curved point being in contact with the small apophysis of the cubital joint; the digital joint is oval, moderately convex and hairy externally, concave within, comprising the palpal organs; they are highly developed, not very complicated in structure, vascular, encircled by a filiform, black spine, and are flesh-coloured. The convex sides of the digital joints are directed from each other.

Though M. Walckenaer has placed this species in the genus *Tegenaria*, yet he has omitted to change its generic name ('Hist. Nat. des Insect. Apt.,' tom. iv, p. 463); and, not perceiving that it is identical with the *Hahnica pratensis* of M. Koch, has also proposed to transfer it, together with the *Hahnica pusilla* (*Agelena montana*, Blackwall) of the latter naturalist, to the genus *Argus* ('Hist. Nat. des Insect. Apt.,' tom. iv, pp. 465, 466, 503); but as the generic characters of both these spiders and those of the *Agelenæ* appear to coincide, neither the proposition of M. Walckenaer nor the genus *Hahnica* of M. Koch is here adopted.

*Agelena elegans* occurs in moist pastures near Llanrwst, and the males have the palpal organs fully developed in August. It spins a minute, horizontal sheet of web in depressions produced by the trampling of cattle, and by other causes, in damp soil; and in August the female constructs a plano-convex cocoon of compact, white silk, measuring  $\frac{5}{34}$ ths of an inch in diameter, which comprises five or six spherical eggs of a yellow colour, not cemented together, and is usually attached by its plane surface to the leaves of plants.

#### AGELENA PROMPTA.

*Agelena prompta*, Blackw., Linn. Trans., vol. xviii, p. 621.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 102.

Length of the female,  $\frac{1}{10}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{24}$ th, breadth,  $\frac{1}{34}$ th; breadth of the abdomen,  $\frac{1}{24}$ th; length of a posterior leg,  $\frac{1}{5}$ th; length of a leg of the third pair,  $\frac{1}{12}$ th.

The eyes of each lateral pair, which are seated on a small tubercle and are nearly contiguous, are the largest, and the intermediate ones of the anterior row are the smallest of the eight. The cephalo-thorax is slightly compressed before; the sides are rounded, depressed, and marked with furrows converging towards an indentation in the middle, and a row of long hairs, directed forwards, extends along the medial line; it is of a brown colour, the anterior part, which is rounded and rather depressed, being the darkest. The falces are strong, conical, and vertical; the maxillæ are short, gibbous at the base, round at the extremity, and slightly inclined towards the lip, which is nearly quadrate, being rather broader at the base than at the extremity. These organs have a reddish-brown tint. The sternum is heart-shaped, and of a yellowish-brown hue. The legs are of a brown colour; the fourth pair is the longest, then the first, and the third pair is the shortest; each tarsus is terminated by



three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base, where a pair of fine teeth is situated. The palpi resemble the legs in colour. The abdomen is oviform, thinly covered with hairs, convex above, projecting over the base of the cephalo-thorax; the upper part has a dark-brown hue, a series of strongly marked, yellowish-brown, angular lines, whose vertices are directed forwards, extending along the middle; the colour of the sides and under part is pale, yellowish-brown, the latter having a band of a deeper shade in the medial line; the superior spinners are much longer than the rest and triarticulate, with the spinning-tubes distributed on the inferior surface of the terminal joint, which is whitish, the remaining portion of these spinners and the whole of the others being of a brown colour; the sexual organs have a dark, red-brown tint; and that of the branchial opercula is whitish.

The sexes are similar in colour, but the male is rather the smaller. The cubital and radial joints of its palpi are short; the former has a slender, curved process on the outer side of the upper part, and the latter projects one which is longer, slenderer at its termination, and more curved, from a prominence or apophysis at the outer side of its extremity; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs; they are moderately developed, not very complicated in structure, prominent at the upper part, nearly encircled by a fine, black spine, and of a pale, red-brown colour.

*Agelena prompta* is included by M. Walckenaer among the synonyma of *Tegenaria emaciata* ('Hist. Nat. des Insect. Apt.,' tom. iv, p. 462), from which species it differs in size, organization, and colour. It conceals itself under stones in woods about Llanrwst, and the male has the palpal organs completely developed in October.

#### AGELENA MONTANA. Pl. X, fig. 100.

*Agelena montana*, Blackw., Linn. Trans., vol. xviii, p. 622.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 102.

*Hahnina pusilla*, Koch, Die Arachn., Band viii, p. 61, tab. 270, figs. 637, 638.

*Argus montanus*, Walck., Hist. Nat. des Insect. Apt., tom. iv, p. 505.

Length of the female,  $\frac{1}{14}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{26}$ th, breadth,  $\frac{1}{36}$ th; breadth of the abdomen,  $\frac{1}{26}$ th; length of a posterior leg,  $\frac{1}{9}$ th; length of a leg of the third pair,  $\frac{1}{13}$ th.

The eyes of each lateral pair are seated on a small tubercle, and are nearly contiguous; they are the largest, and the intermediate ones of the anterior row are the smallest of the eight. The cephalo-thorax is glossy, slightly compressed before, and rounded on the sides, which are depressed, and marked with furrows converging towards a narrow indentation in the middle; the falces are strong, conical, and inclined towards the sternum, which is broad and heart-shaped; the maxillæ are short, gibbous at the base, round at the extremity, and slightly inclined towards the lip, which is nearly semicircular. These parts are of a brown

colour, the lip being much the darkest. The legs have a brown hue, which is palest at the joints; the fourth pair is the longest, the first a little surpasses the second, and the third pair is the shortest; the tarsi are terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base. The palpi resemble the legs in colour, and have a curved claw at their extremity. The abdomen is short, broad, thickly covered with hairs, convex above, projecting over the base of the cephalo-thorax; it is of a dull, brownish-black colour interspersed with obscure, yellowish-brown spots, which are most conspicuous on the sides, and the under part is the palest; a series of obscure, angular lines, of a yellowish-brown hue, whose vertices are directed forwards, occurs on the upper part, in the medial line of the posterior half; the spinners are arranged in a transverse row immediately below the anus; the exterior ones are much the longest, triarticulate, and have the spinning-tubes disposed on the inferior surface of the terminal joint; the second joint of all the spinners has a reddish-brown tint, and that of the other joints is yellowish-white; the sexual organs are prominent; and the branchial opercula have a whitish hue. Some individuals of this species are much paler than others.

The male is rather smaller and darker coloured than the female. Its palpi are short; a long, slender process, curved in a circular form at its extremity, occurs at the base of the cubital joint, on the under side, and the radial joint projects from its extremity, on the under side, a black, strongly curved, filiform spine directed outwards; the digital joint is oval, convex and hairy externally, concave within, and comprises the palpal organs; these organs are highly developed, not very complex in structure, with a black, filiform spine curved round their inner side and extremity, and are of a brown colour. The convex sides of the digital joints are directed outwards.

Adult females of *Agelena montana* were discovered in February, 1837, under stones on Galt y Rhyg, a mountain near Llanrwst, in Denbighshire; and in August, 1852, both sexes, in a state of maturity, were found among moss in woods on the slopes of the same mountain.

In transferring this spider to the genus *Argus*, with which it has no relation of affinity, M. Walckenaer has not perceived that it is specifically identical with the *Hahnia pusilla* of M. Koch.

#### AGELENA NAVA. Pl. X, fig. 101.

*Agelena nava*, Blackw., Linn. Trans., vol. xviii, p. 623.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 102.

*Argus navus*, Walck., Hist. Nat. des Insect. Apt., tom. iv, p. 506.

Length of the female,  $\frac{1}{15}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{24}$ th, breadth,  $\frac{1}{36}$ th; breadth of the abdomen,  $\frac{1}{32}$ d; length of a posterior leg,  $\frac{1}{12}$ th; length of a leg of the third pair,  $\frac{1}{15}$ th.

The anterior part of the cephalo-thorax is compressed; the sides are rounded, depressed,

and marked with furrows converging towards an indentation in the middle, and a row of long hairs, directed forwards, extends along the medial line; the falces are strong, conical, and vertical; the maxillæ are short, convex at the base, round at the extremity, and slightly inclined towards the lip, which is nearly quadrate, being rather broader at the base than at the extremity; the sternum is heart-shaped. These parts are glossy, and, with the legs and palpi, are of a dark-brown colour, the margins of the cephalo-thorax and the base of the lip being much the darkest. Each tarsus is terminated by two curved, pectinated claws. The lateral eyes are the largest, and the intermediate ones of the anterior row are the smallest of the eight. The abdomen is soot-coloured, short, thickly covered with hairs, rather broader at the posterior than at the anterior extremity, convex above, and projects a little over the base of the cephalo-thorax; the colour of the spinners is brown; they are disposed in a transverse row immediately below the anus, and the exterior ones, which are much longer than the rest, and triarticulate, have the spinning-tubes distributed on the inferior surface of the terminal joint; the sexual organs are prominent, and of a dark, reddish-brown hue; and the branchial opercula have a pale-yellow tint.

The male is smaller than the female, but it does not differ from her in colour. The cubital and radial joints of its palpi are short; the former, which is the larger, has a fine, prominent process on the outer side, near the upper part, which is curved upwards at its extremity; and the latter is terminated, on the under side, by a pointed apophysis curved outwards; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs; they are highly developed, not very complicated in structure, with a pointed, corneous process, which originates near the middle of the outer side, and is curved upwards; their colour is dark-brown. The convex sides of the digital joints are directed outwards.

About midsummer, this species, which, notwithstanding its close connexion with the *Agelena*, M. Walckenaer has placed in the genus *Argus* (see the synonyma), may be seen in considerable numbers running on the ground, and on rails and gates, in pastures near Llanrwst. The palpal organs of the male are fully developed in May.

AGELENA BRUNNEA. Pl. X, fig. 102.

*Agelena brunnea*, Blackw., Lond. and Edinb. Phil. Mag., third series, vol. iii, p. 351.

— — Blackw., Research. in Zool., p. 351.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 102.

Length of the female,  $\frac{1}{3}$ d of an inch; length of the cephalo-thorax,  $\frac{1}{8}$ th, breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{1}{10}$ th; length of a posterior leg,  $\frac{1}{4}$ ; length of a leg of the third pair,  $\frac{7}{10}$ ths.

The eyes are seated on black spots; those constituting the anterior row, which are

situated immediately above the frontal margin, are rather larger than those of the posterior row, the two intermediate ones being the largest of the eight. The cephalo-thorax is convex, somewhat hairy, compressed before, and rounded on the sides, which are depressed, and marked with furrows converging towards the middle; it is of a red-brown colour, with fine, brownish-black, lateral margins, and lines of the same hue, on each side, describing narrow, oblique triangles, whose vertices are directed towards the middle, the small area enclosed by each being of a red-brown hue. The falces are strong, conical, vertical, prominent at the base, and armed with a few teeth on the inner surface; the maxillæ are short, convex, rounded at the extremity, and slightly inclined towards the lip, which is nearly quadrate, being rather broader at the base than at the extremity; the sternum is heart-shaped; the legs and palpi are moderately long and robust, and are provided with hairs and spines. These parts are of a red-brown colour, the lip being the darkest. Each tarsus is terminated by two curved, deeply pectinated claws, and the palpi have a curved, pectinated claw at their extremity. The abdomen is oviform, hairy, somewhat larger at the posterior than at the anterior extremity, convex above, and projects over the base of the cephalo-thorax; its colour is yellow-brown, a series of brownish-black, angular lines, whose vertices are directed forwards, extending along the middle of the upper part; the sides are marked with spots of a brownish-black hue; those on their posterior half are sometimes confluent, forming oblique lines, and an irregular spot of a larger size occurs on each side of the spinners; on the under part there are three faint, longitudinal bands of a dull-brown colour, which meet at the posterior extremity, where the short spinners are situated; the sexual organs have a dark, reddish-brown tint; and the colour of the branchial opercula is yellow.

In the design formed by the distribution of their colours the sexes resemble each other, but the male is rather the smaller. The cubital and radial joints of its palpi are short; the former is the stronger, and the latter has a long, acute apophysis, bent downwards at the point, projecting from the outer side of its extremity; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, prominent, complicated in structure, with several curved, pointed, corneous processes at the extremity, and are of a red-brown colour.

*Agelena brunnea* is of rare occurrence in woods in the valley of the Conway. The sexes pair in May, and in the same month the female constructs an elegant, vase-shaped cocoon of white silk, of a fine, compact texture, attached by a short foot-stalk to rushes, the stems of grass, heath, or gorse; it measures about one fourth of an inch in diameter, and contains from forty to fifty yellowish-white, spherical eggs, enveloped in white silk connected with the interior surface of the cocoon contiguous to the foot-stalk. Greatly to the disadvantage of its appearance, the entire cocoon is smeared with moist soil, which, drying, serves to protect it from the weather, and, as an additional security, the extremity is closed and directed downwards.

Mr. J. Hardy has found this species in Berwickshire.

AGELENA CELANS. Pl. X, fig. 103.

*Agelena celans*, Blackw., Linn. Trans., vol. xviii, p. 624.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii,  
p. 332.

*Argus* — Walck., Hist. Nat. des Insect. Apt., tom. iv, p. 504.

Length of the female,  $\frac{1}{8}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{12}$ th, breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{1}{14}$ th; length of a posterior leg,  $\frac{5}{10}$ ths; length of a leg of the third pair,  $\frac{5}{14}$ ths.

The intermediate eyes of the anterior row are much the smallest, and those constituting each lateral pair are the largest of the eight. The cephalo-thorax is slightly compressed before, and the sides are rounded, depressed, and marked with furrows which converge towards a narrow indentation in the medial line; it is hairy, and of a very dark-brown colour, with yellowish-brown lateral margins, and a band of the same hue extending along the middle. The falces are strong, conical, vertical, and armed with a few teeth on the inner surface; the maxillæ are short, convex at the base, round at the extremity, and slightly inclined towards the lip, which is quadrate, being rather broader at the base than at the extremity. These organs are of a brown colour, tinged with red, the base of the lip being much the darkest. The sternum is short, heart-shaped, and has a yellowish-brown tint. The legs and palpi are of a brown hue, tinged with red, the thighs being the palest; the tibiæ and metatarsi of the first and second pairs of legs have a series of large, sessile spines on each side of their inferior surface; each tarsus is terminated by two curved, pectinated claws; and the palpi have a small, curved claw at their extremity. The abdomen is oviform, hairy, rather broader at the posterior than at the anterior extremity, convex above, projecting over the base of the cephalo-thorax; the upper part is of a very dark-brown hue, with reddish-brown and scattered hairs of a yellowish-brown colour intermixed; an obscure, dentated, reddish-brown band extends along the middle; and the under part is of a yellowish-brown hue, marked with three faint, longitudinal lines of a darker shade; the spinners are short; and the branchial opercula have a pale-yellow tint.

Both sexes are similar in colour, but the male is the smaller. The cubital and radial joints of its palpi are short, the latter having a straight, pointed apophysis at its extremity, on the outer side; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs; they are highly developed, rather complicated in structure, vascular, with a black, corneous process at the extremity, which is broad, depressed, curved near the base, and abruptly recurved about the middle; their colour is red-brown.

This scarce species may occasionally be met with running upon the ground, or concealed under stones, in woods about Llanrwst. The palpal organs of the male are developed in August. Though intimately allied to the *Agelenæ*, yet M. Walckenaer has included this spider in the genus *Argus*.



AGELENA GRACILIPES. Pl. X, fig. 104.

*Agelena gracilipes*, Blackw., Annals and Mag. of Nat. Hist., third series, vol. iii, p. 97.

Length of the male,  $\frac{1}{10}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{16}$ th, breadth,  $\frac{1}{24}$ th; breadth of the abdomen,  $\frac{1}{24}$ th; length of a posterior leg,  $\frac{5}{24}$ ths; length of a leg of the third pair,  $\frac{3}{20}$ ths.

The cephalo-thorax is convex, glossy, slightly compressed before, rounded and depressed on the sides, which are marked with furrows converging towards a slight, narrow indentation in the medial line; it is of a dark-brown colour, tinged with dull-yellow, especially in the medial line, the lateral margins being the darkest. The eyes are disposed on the anterior part of the cephalo-thorax in two transverse, curved rows, whose convexity is directed backwards; the intermediate eyes of both rows form a trapezoid, whose shortest side is before, those of the anterior row, which is rather the less curved, being the smallest of the eight. The falces are conical and vertical; the maxillæ are short, convex near the base, rounded at the extremity, and slightly inclined towards the lip; and the sternum is heart-shaped. These parts are of a brownish-yellow colour, the base of the falces being the brownest. The lip is nearly quadrate, being rather broader at the base than at the apex, and has a dark-brown hue. The legs are long, slender, provided with hairs and sessile spines, two parallel rows of the latter occurring on the inferior surface of the tibiæ and metatarsi of the first and second pairs, and are of a dull-yellow colour, with the exception of the genual joint, tibia, and metatarsus of the first and second pairs, which have a very dark-brown hue, the genual joint being the palest; each tarsus is terminated by two curved, pectinated claws. The palpi have a dull-yellow hue; the cubital and radial joints are short, and the latter projects a brown, pointed apophysis from its extremity, on the outer side; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs, which are moderately developed, rather prominent, not very complicated in structure, with a small, curved, black spine at their extremity, and are of a dull-yellow colour, tinged with brown. The abdomen is oviform, thinly clothed with hairs, convex above, and projects over the base of the cephalo-thorax; it has a brownish-black hue on the upper part, with an obscure mark of a quadrilateral figure, and yellow-brown colour, at its anterior extremity; and between this mark and the spinners there is a series of obscure, curved, yellow-brown lines, having their convexity directed forwards; the under part is of a yellowish-brown colour, strongly tinged with dark-brown at its posterior extremity, and the spinners, which are short, have a pale-yellow hue.

The Rev. O. P. Cambridge took this spider at Lyndhurst, in the New Forest, in September, 1858.

*Genus* TEGENARIA (*Walckenaer*).

*Eyes* nearly equal in size, disposed on the anterior part of the cephalo-thorax in two transverse rows; the anterior row is almost straight, and the posterior row, which is curved, has its convexity directed backwards.

*Maxillæ* long, straight, narrower at the base than at the extremity, the outer side of which is rounded, and the inner side is obliquely truncated.

*Lip* nearly quadrilateral, and notched or somewhat hollowed at the extremity.

*Legs* long and rather slender; the first pair, or the fourth, is the longest.

## TEGENARIA DOMESTICA. Pl. XI, fig. 105.

*Tegenaria domestica*, Walck., Hist. Nat. des Insect. Apt., tom. ii, p. 2, pl. 16, fig. 2.

— — Koch, Die Arachn., Band viii, p. 25, tab. 260, figs. 607, 608.

— — Blackw., Linn. Trans., vol. xix, p. 117.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 332.

— *petrensis*, Koch, Die Arachn., Band viii, p. 27, tab. 260, fig. 609.

*Aranea domestica*, Latr., Gen. Crust. et Insect., tom. i, p. 96.

*Agelena* — Sund., Vet. Acad. Handl., 1831, p. 125.

Length of the female,  $\frac{5}{8}$ ths of an inch; length of the cephalo-thorax,  $\frac{7}{32}$ ths, breadth,  $\frac{5}{32}$ ths; breadth of the abdomen,  $\frac{7}{32}$ ths; length of an anterior leg,  $1\frac{7}{16}$ ths; length of a leg of the third pair,  $1\frac{1}{4}$ th.

The legs are long, slender, provided with hairs and sessile spines, and of a red-brown hue, marked with brownish annuli; the first pair is the longest, then the fourth, and the third pair is the shortest; each tarsus is terminated by three claws; the two superior ones are curved and deeply pectinated, and the inferior one is inflected near its base, on each side of which there are two small teeth. The palpi resemble the legs in colour, and have a curved, pectinated claw at their extremity. The cephalo-thorax is compressed before, convex in the cephalic region, and rounded on the sides, which are depressed and marked with furrows converging towards an oblong indentation in the middle; it is covered with yellowish-brown hairs, and is of a pale, reddish-brown colour, the anterior part being the darkest; on each lateral margin there is an irregular, longitudinal, brownish-black band, and another of the same hue extends along each side of the medial line. The eyes are nearly equal in size; the

four intermediate ones almost describe a square, and those of each lateral pair are seated obliquely on a tubercle. The falces are strong, conical, vertical, supplied with yellowish-brown hairs, and are armed with two rows of teeth on the inner surface; the maxillæ are powerful; the lip is longer than broad, and somewhat hollowed at the extremity. These parts have a dark, reddish-brown tint, the extremities of the maxillæ and lip being much the palest. The sternum is broad, heart-shaped, pointed at the posterior extremity, hairy, and of a reddish-brown colour, with a dark-brown band on each side, comprising several reddish-brown spots. The abdomen is oviform, hairy, convex above, projecting over the base of the cephalo-thorax; a dentated, brownish-red band, bordered with black, extends along the middle of the upper part, and disposed on the black border, on each side of this band, there is a series of yellow spots, diminishing in size as they approach the spinners; the first two spots of each series are the most conspicuous, the anterior one, which is the larger, being of an irregular figure; the sides and under part are of a yellowish-brown colour, thickly spotted and streaked with brownish-black, a dull-yellow line extending along each side of the latter; the superior spinners are triarticulate, the spinning-tubes being disposed on the inferior surface of the terminal joint; and the branchial opercula have a yellowish tint. Numerous compound, sessile hairs occur on the body and limbs of this spider.

The male is smaller and darker coloured than the female, and the relative length of its legs is different, the second pair being longer than the fourth; their absolute length also is greater, the anterior one of a large individual sometimes measuring  $2\frac{1}{2}$  inches. The thighs of the first and second pairs of legs have a dark, reddish-brown tint, those of the anterior pair being the darkest. The palpi have a dark, reddish-brown hue; the radial joint is much longer than the cubital, and has an obtuse apophysis near its extremity, on the outer side, which projects from its base a blackish, slightly bifid process, and immediately below this apophysis, at the extremity of the joint, there is a larger, paler, and more obtuse one; the digital joint is long, hairy, convex above, at the base, but cylindrical and pointed at the end; the palpal organs are connected with a cavity on the under side of the basal convexity, and are moderately developed, prominent, complicated in structure, with a bold process at the base, terminated by a curved, pointed, black spine, and a large, oblong part, situated at the outer side, a cavity in which receives the point of a long, slender, curved, black spine, originating near the base, on the inner side; their colour is red-brown.

Specimens of *Tegenaria domestica* have been received from Cambridgeshire, Oxfordshire, and Middlesex. It inhabits old buildings, spinning an extensive, horizontal sheet of web in angles formed by the transverse junction of their walls, and in various other situations: connected with the web, which, in addition to its lateral points of contact, is supported by numerous fine lines attached to both surfaces and to adjacent objects above and below it, is a short tube, usually situated in the angle formed by the walls, which, being open at its extremities, not only affords a retreat to the spider, but a ready medium of communication also with every part of its snare. The sexes pair in May, and in the two following months the female constructs several lenticular cocoons of white silk of a fine texture, measuring about  $\frac{1}{8}$ ths of an inch in diameter, each of which contains from 130 to 150 spherical eggs of a yellowish-white colour, not agglutinated together. All the cocoons are inclosed in separate sacs composed of compact, white silk, having particles of plaster, whitewash, and other heterogeneous materials, distributed upon their exterior surface.

The spider alluded to by Mr. Jesse, in his 'Scenes and Tales of Country Life,' p. 339, as being peculiar to Hampton Court, and there named the "*Cardinal*," most probably is this species.

TEGENARIA ATRICA. Pl. XI, fig. 106.

*Tegenaria atrica*, Koch, Die Arachn., Band x, p. 105, tab. 353, fig. 825.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 333.

— *sava*, Blackw., Annals and Mag. of Nat. Hist., vol. xiii, p. 179.

Length of the female,  $\frac{7}{16}$ ths of an inch; length of the cephalo-thorax,  $\frac{5}{16}$ ths, breadth,  $\frac{7}{32}$ nds; breadth of the abdomen,  $\frac{1}{4}$ th; length of a posterior leg,  $1\frac{1}{4}$ th; length of a leg of the third pair, 1.

The legs are long, hairy, and of a reddish-brown colour, with the exception of the thighs of the second, third, and fourth pairs, which have a dull, greenish-brown hue, and several black spots occur on the under side of each coxa; the fourth pair is the longest, then the first, and the third pair is the shortest; each tarsus is terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base, which is furnished with several fine teeth. The palpi have a curved, pectinated claw at their extremity, and their colour is dark, reddish-brown. The anterior part of the cephalo-thorax is compressed, and the sides, which are rounded, are marked with furrows converging towards a narrow indentation in the medial line; it is thickly covered with hairs, and has a pale, yellowish-brown tint, a fine line extending along the middle of the anterior part, a broad, irregular, longitudinal band on each side, and the lateral margins, having a dark-brown hue. The eyes are almost equal in size; the four intermediate ones nearly describe a square, the two anterior ones being rather the largest of the eight; and those constituting each lateral pair are seated obliquely on a small tubercle, but are not contiguous. The falces are powerful, conical, vertical, provided with two rows of teeth and some long hairs on the inner surface, and are of a dark, reddish-brown colour, approaching to black. The maxillæ are strong; the lip is longer than broad, and slightly notched at the extremity. These parts are of a reddish-brown hue, their extremities being the palest, and the base of the lip the darkest. The sternum is heart-shaped; a red-brown band extends along the middle, which decreases in breadth to its posterior extremity, and on each side there is a large, dark-brown, semilunar band, comprising several circular, red-brown spots situated opposite to the legs. The abdomen is oviform, hairy, convex above, projecting over the base of the cephalo-thorax; along the middle of the upper part a series of yellowish-brown, angular lines extends; these lines become shorter and less conspicuous as they approach the spinners, and their vertices, which are directed forwards, are obliterated at the anterior part of the series by a longitudinal band of a yellowish-brown hue; alternating with their extremities, which are greatly enlarged, there are black blotches of an irregular figure; the sides and under part have a yellowish-brown tint; the former is thickly spotted with black, and the latter has an obscure band on each side of the medial line; these bands are composed of

numerous black spots, and meet at the spinners; the superior spinners are long, hairy, and triarticulate; the second joint is black, and the terminal joint, which tapers to its extremity, and has the spinning-tubes disposed on its inferior surface, is of a reddish-brown colour; the branchial opercula have a dull-yellow hue. The body and limbs of this species are provided with numerous compound, sessile hairs.

The male is smaller, paler, and less distinctly marked than the female, and the relative length of its legs is different, the first pair being longer than the fourth; their absolute length also is greater, an anterior one measuring 1 inch and  $\frac{19}{100}$ ths. The palpi are of a yellowish-brown colour, with the exception of the radial and digital joints, which have a reddish-brown tint; the radial joint is longer than the cubital, and has two apophyses at its extremity; one, situated on the outer side, is large, black, and obtuse, and the other, situated underneath, is acute and of a red-brown hue; the digital joint is long, hairy, convex above, at the base, but cylindrical and pointed at the end; the palpal organs are connected with a cavity on the under side of the basal convexity, and are moderately developed, prominent, rather complicated in structure, with a strong, black, pointed process projecting boldly from their base, a prominent scale-like process at the inner side of the upper part, and a long, slender, curved, black spine originating near their extremity, on the inner side, and directed obliquely upwards towards the outer side; their colour is red-brown.

In the autumn of 1843, Miss Gertrude Buller Elphinstone found this fine species, which ranks among our largest indigenous spiders, in dwelling-houses and conservatories at Enfield, in Middlesex. Subsequently, Miss Ellen Clayton has obtained specimens of it at Oxford.

When in captivity, *Tegenaria atrica* constructs a horizontal sheet of web, with a short tube at one of the margins, which serves it for a retreat.

Several months after the publication of the description of this species in the 'Annals and Magazine of Natural History,' vol. xiii., p. 179, the tenth volume of 'Die Arachniden' was received, when the fact was ascertained that it had been previously described in that work; such being the case, the specific name *atrica*, conferred upon it by M. Koch, must take precedence of that of *sæva*, which will follow as a synonym.

TEGENARIA CIVILIS. Pl. XII, fig. 107.

*Tegenaria civilis*, Walck., Hist. Nat. des Insect. Apt., tom. ii, p. 7, pl. 16, fig. 1.

— — Koch, Die Arachn., Band viii, p. 37, tab. 264, figs. 618, 619.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 334.

— *domestica*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 13.

*Agelena civilis*, Sund., Vet. Acad. Handl., 1831, p. 127.

*Titulus* 17, Lister, Hist. Animal. Angl., De Aran., p. 59, tab. i, fig. 17.

Length of the female,  $\frac{3}{10}$ ths of an inch; length of the cephalo-thorax,  $\frac{3}{10}$ ths, breadth,  $\frac{1}{5}$ th; breadth of the abdomen,  $\frac{1}{5}$ th; length of a posterior leg,  $\frac{4}{5}$ ths; length of a leg of the third pair,  $\frac{3}{5}$ ths.



The four intermediate eyes form a trapezoid, the two constituting its anterior side, which is rather the shortest, being the smallest of the eight; the eyes of each lateral pair are placed obliquely on a small tubercle, but are not contiguous. The cephalo-thorax is compressed before, rounded on the sides, convex, hairy, and slightly glossy; it has a pale, reddish-brown tint; but the lateral margins and a broad band extending along each side are soot-coloured. The falces are powerful, conical, vertical, and are provided with two rows of teeth, and some long, reddish hairs on the inner surface; the maxillæ are strong; the lip is rather longer than broad, and its extremity is slightly notched. These organs are of a reddish-brown colour; the falces are the darkest, and the extremities of the maxillæ and lip have a yellowish-brown tint. The sternum is heart-shaped; it is of a reddish-brown hue, with faint, soot-coloured annuli on the sides, opposite to the legs. The legs and palpi are long, slender, supplied with hairs and sessile spines, and are of a reddish-brown colour; the metatarsi and tarsi of the former, and the radial and digital joints of the latter, being the darkest; the thighs and tibiæ are marked with several obscure, soot-coloured annuli, those on the former being the most conspicuous. The fourth pair of legs is the longest, then the first, and the third pair is the shortest; each tarsus is terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base, on each side of which there are two fine teeth. The palpi have a curved, pectinated claw at their extremity. The abdomen is oviform, thickly covered with hairs, convex above; projecting over the base of the cephalo-thorax; it is of a yellowish-brown hue, with a series of triangular, soot-coloured spots, the anterior one of which is the largest, extending along the middle of the upper part; the sides are marked with oblique rows of soot-coloured spots, more or less confluent, and on the under part there are three imperfectly defined, longitudinal, soot-coloured bands; the spinners have a yellowish-brown tint; the two superior ones are the longest, are triarticulate, and have the spinning-tubes disposed on the inferior surface of the terminal joint; the sexual organs, which are minute, have a red-brown hue; and the colour of the branchial opercula is yellowish-white. This spider has sometimes a pale, reddish-brown tint, and the soot-coloured marks are subject to slight modifications of form and size. Like some other species of the family *Agelenidæ*, *Tegenaria civilis* has numerous compound, sessile hairs on its body and limbs.

The male bears a near resemblance to the female, and the relative length of its legs is the same, but the thighs are of a dark, reddish-brown colour, with only a faint appearance of annuli. The cubital and radial joints of the palpi are short, and the latter, which is the larger, projects a strong, black, pointed, corneous apophysis from its extremity, on the outer side; the digital joint is long, hairy, convex above, at the base, but cylindrical and pointed at the end; the palpal organs are connected with a cavity on the under side of the basal convexity, and are moderately developed, rather complicated in structure, with a strong, black, curved spine near their extremity, and a prominent, pointed, semi-transparent process on the outer side, below which, and almost contiguous to it, there is a process whose extremity is crescent-shaped; their colour is red-brown.

The habits and economy of this common spider are very similar to those of *Tegenaria domestica*, for which it has frequently been mistaken, even naturalists of high authority having included references to Lister's description and figure of it among the synonyma of that species. During the summer and autumn, the female constructs several lenticular

cocoons of white silk of a fine texture, measuring about  $\frac{3}{10}$ ths of an inch in diameter, in each of which she deposits from fifty to sixty spherical eggs of a yellowish-white colour, not adherent among themselves; these cocoons are attached to walls or other objects in the vicinity of her web, and have generally particles of plaster, whitewash, or mortar disposed on their exterior surface.

In Scotland and Ireland this species is abundant.

The following remarkable physiological facts in connexion with *Tegenaria civilis*, have been ascertained by observation and experiment; namely, that both sexes change their integument nine times before they arrive at maturity, once in the cocoon, and eight times after quitting it; that a leg of a young individual, detached at the coxa six times consecutively, may be reproduced at each succeeding change of integument after the infliction of the injury; that the life of this species extends through a period of four years; that the sexual organs of the male are connected with the digital joint of the palpi; and that the female, after impregnation, is capable of producing nine sets of prolific eggs in succession without renewing her intercourse with the male, more than two years elapsing before all are deposited, and ten months nearly intervening sometimes between the deposition of two consecutive sets.

TEGENARIA SILVICOLA. Pl. XII, fig. 108.

*Tegenaria silvicola*, Walck., Hist. Nat. des Insect. Apt., tom. iv, p. 464.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. xx, p. 500.

*Hahnia* — Koch, Die Arachn., Band xii, p. 158, tab. 432, figs. 1076, 1077.

Length of the female,  $\frac{1}{5}$ th of an inch; length of the cephalo-thorax,  $\frac{1}{20}$ th, breadth,  $\frac{1}{24}$ th; breadth of the abdomen,  $\frac{1}{10}$ th; length of a posterior leg,  $\frac{1}{5}$ th; length of a leg of the third pair,  $\frac{1}{8}$ th.

The legs are moderately long, provided with hairs and sessile spines, two parallel rows of the latter occurring on the inferior surface of the tibiæ and metatarsi of the first and second pairs; the fourth pair is the longest, then the first, and the third pair is the shortest; they have a yellowish-brown colour, with brownish-black spots on the inferior surface of the femora, and annuli of the same hue on the tibiæ and metatarsi. The palpi are of a uniform yellowish-brown colour. The eyes are disposed on the anterior part of the cephalo-thorax in two slightly curved, parallel rows, whose convexity is directed backwards; the four intermediate ones describe a trapezoid, and the two anterior ones, which constitute its shortest side, are the smallest and darkest of the eight. The cephalo-thorax is convex, glossy, compressed before, and rounded on the sides, which are marked with furrows converging towards an indentation in the medial line; it is of a pale-brown colour, with narrow, dark-brown margins, and oblique lines of the same hue on the sides. The falces are conical, and inclined towards the sternum, which is heart-shaped; the maxillæ are straight, and rounded at the extremity; and the lip is short, and somewhat quadrate, being rather broader

at the base than at the apex. These parts have a pale-brown hue, the lip and sternum being the darkest, and the falces the palest. The abdomen is oviform, glossy, thinly clothed with hairs, convex above, projecting over the base of the cephalo-thorax; the upper part is of a very dark-brown colour, with a broad, dentated, yellow-brown band extending along the middle, whose anterior part comprises a brownish-black streak, which tapers to a point at its posterior extremity; the sides are mottled with yellowish-brown, and the under part has three obscure, dark, longitudinal bands on a yellowish-brown ground; the spinners have a yellow-brown hue, and the two superior ones, which are triarticulate, have the spinning-tubes disposed on the inferior surface of the terminal joint; the colour of the sexual organs is red-brown, and that of the branchial opercula yellowish-brown.

The male, according to M. Koch, resembles the female in the design formed by the distribution of its colours. The radial joint of its palpi has a brownish hue; the colour of the digital joint is yellow-brown, and that of the palpal organs, which are fully developed in winter, is dark-brown.

An adult female *Tegenaria silvicola* was captured in Norfolk by the Rev. Hamlet Clark, in May 1854; and another specimen was taken by Mr. R. H. Meade in Buckinghamshire, in the autumn of the same year.

*Genus CÆLOTES, Blackwall.*

*Eyes* disposed on the anterior part of the cephalo-thorax in two transverse, nearly straight, parallel rows; the intermediate ones of the anterior row, which is the shorter of the two, and situated immediately above the frontal margin, are the smallest, and with the intermediate ones of the posterior row describe a trapezoid whose shortest side is before; each lateral pair is placed obliquely on a tubercle.

*Maxillæ* powerful, curved towards the lip, enlarged at the base, externally, where the palpi are inserted, and greatly dilated at the extremity, which is rounded on the outer and obliquely truncated on the inner side.

*Lip* rather longer than broad, curved on the sides, and truncated at the extremity.

*Legs* robust; the fourth pair is the longest, then the first, and the third pair is the shortest.

CÆLOTES SAXATILIS. Pl. XII, fig. 109.

*Cælotes saxatilis*, Blackw., Linn. Trans., vol. xviii, p. 618, tab. 39, figs. 6—8.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 334.

*Clubiona* — Blackw., Lond. and Edinb. Phil. Mag., third series, vol. iii, p. 436.

*Drassus* — Blackw., Research. in Zool., p. 332.

- Aranea terrestris*, Wider, Museum Senckenb., Band i, p. 215, taf. 14, fig. 10.  
*Amaurobius terrestris*, Koch, Die Arachn., Band vi, p. 45, tab. 192, figs. 463, 464.  
 — *subterraneus*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 15.  
 — *tigrinus*, Koch, Uebers. des Arachn. Syst., erstes Heft, p. 16.

Length of the female,  $\frac{11}{20}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{4}$ th, breadth,  $\frac{3}{20}$ ths; breadth of the abdomen,  $\frac{1}{3}$ th; length of a posterior leg,  $\frac{3}{8}$ ths; length of a leg of the third pair,  $\frac{1}{2}$ .

The cephalo-thorax is large, convex, glossy, compressed before, somewhat depressed and truncated in front, and rounded on the sides, which are depressed and marked with slight furrows converging towards a narrow indentation in the medial line; the falces are powerful, vertical, triangular, very prominent at the base, and provided with two rows of teeth and a dense fringe of hairs on the inner surface; the maxillæ are strong, and fringed with hairs at the extremity, on the inner side; the sternum is heart-shaped and glossy, with slight prominences on the sides, opposite to the legs; the legs and palpi are robust, and provided with hairs and spines; each tarsus is terminated by three claws; the two superior ones are curved and deeply pectinated, and the inferior one is inflected near its base, which is furnished with two pairs of fine teeth; the palpi have a curved, pectinated claw at their extremity. These parts, with the lip, are of a dark, reddish-brown colour, the legs and palpi being the reddest, and the anterior part of the cephalo-thorax, the falces, maxillæ, and lip much the darkest. The abdomen is oviform, hairy, broader at its posterior than at its anterior extremity, and projects a little over the base of the cephalo-thorax; it is of a yellowish-brown colour, spotted with black, and a black band, tapering from its anterior extremity to the spinners, extends along the middle of the upper part; on each side of this band there is a series of short, oblique, yellowish-brown lines, which, in some individuals, unite in the posterior region, forming angles whose vertices are directed forwards; the black spots on the under part are few in number and minute; the superior spinners, which are the longest, are triarticulate, and have the spinning-tubes distributed on the inferior surface of the terminal joint; the sexual organs are glossy, of a red-brown colour, with a longitudinal septum in the middle; and the branchial opercula have a pale-yellow hue.

The sexes are similar in colour, but the male is the smaller. The cubital and radial joints of its palpi are short; a large apophysis occurs on the outer side of the former, and the latter projects two apophyses from its extremity, one on the outer side, which is acute, and the other in front, which is obtuse and short; the digital joint is of an oblong-oval form, and is compact and pointed at its extremity; it is convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, complicated in structure, with a bold, obtuse protuberance on the outer side, and a curved, finely pointed spine on the inner side; they are of a dark, reddish-brown colour.

A description of this interesting species, which was discovered in the spring of 1826, beneath loose fragments of rock on Snowdon, in Caernarvonshire, was originally given in the 'London and Edinburgh Philosophical Magazine,' under the name of *Clubiona saxatilis*. The result of an examination of specimens procured afterwards in various parts of North Wales, Lancashire, and Yorkshire, was its removal to the genus *Drassus* ('Researches in

Zoology'). Subsequent investigations, however, made with great care, have served to establish the fact that it appertains to the *Agelenidae*, as it possesses several marked characteristics in common with the spiders of that family; for example, the anterior part of its cephalo-thorax is compressed; the superior spinners are triarticulate, are longer than the rest, and have the spinning-tubes disposed on the under side of the terminal joint; each inferior tarsal claw is provided with two pairs of fine teeth near the base, and its web is of a compact texture, having a tube in connexion with it, extending usually to the extremity of a cylindrical cavity in the earth, which is frequently excavated by the animal itself. These facts do not appear to have received that degree of consideration from M. Walekenaer which their importance demands, as he still seems disposed to retain *Cælotes saxatilis* in the genus *Clubiona* ('Hist. Nat. des Insect. Apt.,' t. iv, pp. 441, 442). With regard to the genus *Amaurobius* of M. Koch, as it includes spiders belonging to different families, which are easily distinguished by their organization, economy, and habits, it must, as at present constituted, be rejected by systematic naturalists. The great defect of the genera attempted to be established by M. Koch is, that they are founded too exclusively on the disposition, form, and relative size of the eyes; consequently, it sometimes happens that they comprise species in other respects decidedly incongruous.

*Cælotes saxatilis* pairs in April, and in May the female deposits about 120 spherical eggs, of a yellowish-white colour, not agglutinated together, in a lenticular cocoon composed of white silk, of a fine but compact texture, measuring half an inch in diameter; it is generally attached to the inferior surface of stones by a small covering of web, on the outer side of which particles of indurated soil are frequently distributed.

*Genus* TEXTRIX, *Sundevall*.

*Eyes* unequal in size, distributed on the anterior part of the cephalo-thorax in two transverse rows; four constituting the anterior row, which is slightly curved, are adjacent and minute; the posterior row is greatly curved, having its convexity directed forwards, and comprises the other four eyes, which are large and separated by wide intervals, the two intermediate ones being the largest of all.

*Maxillæ* curved towards the lip, enlarged and rounded at the extremity.

*Lip* large and nearly quadrate.

*Legs* moderately long; the fourth pair is the longest, and the other three pairs are equal in length, or nearly so.



## TEXTRIX LYCOSINA. Pl. XII, fig. 110.

*Textrix lycosina*, Sund., Consp. Arachn., p. 19.

— — Koch, Uebers, des Arachn. Syst., erstes Heft, p. 14.

— — Koch, Die Arachn., Band viii, p. 46, tab. 266, figs. 623, 624.

— — Blackw., Annals and Mag. of Nat. Hist., second series, vol. viii, p. 336.

— *agilis*, Blackw., Lond. and Edinb. Phil. Mag., third series, vol. iii, p. 109.

— — Blackw., Research. in Zool., p. 348, pl. 3, figs. 1, 2.

*Agelena lycosina*, Sund., Vet. Acad. Handl., 1831, p. 130.

*Tegenaria lycosina*, Walck., Hist. Nat. des Insect. Apt., tom. ii, p. 15.

*Titulus* 20, Lister, Hist. Animal. Angl., De Aran., p. 67, tab. 1, fig. 20.

Length of the female,  $\frac{3}{10}$ ths of an inch; length of the cephalo-thorax,  $\frac{1}{3}$ th, breadth,  $\frac{1}{10}$ th; breadth of the abdomen,  $\frac{1}{9}$ th; length of a posterior leg,  $\frac{2}{30}$ ths; length of a leg of the third pair,  $\frac{3}{10}$ ths.

The cephalo-thorax is compressed, elongated, and prominent before, and the sides, which are rounded, depressed, and glossy, are marked with furrows converging towards a narrow indentation in the medial line; it is of a dark, brownish-black colour, with a yellowish-white band of short hairs extending along the middle, and numerous long, black hairs in front. The falces are strong, conical, armed with a few teeth on the inner surface, and inclined towards the sternum, which is heart-shaped. These parts, with the maxillæ and lip, have a brownish-black hue, the two latter organs being much the palest, particularly at their extremities. The legs are provided with hairs, and numerous erect, black spines, and are of a light-brown colour, with brownish-black annuli; each tarsus is terminated by three claws; the two superior ones are curved and deeply pectinated, and the inferior one is inflected near its base, which is furnished with two pairs of small teeth. The palpi resemble the legs in colour, and have a slender, curved, pectinated claw at their extremity. The abdomen is oviform, thickly covered with hairs, convex above, and projects a little over the base of the cephalo-thorax; the upper part is black, with a broad, dentated, yellowish-white band extending along the middle; the anterior part of the band comprises four small, irregular, black spots, forming a parallelogram; the sides are mottled with yellowish-white, and the under part, which has a reddish-brown tint, is sparingly spotted with black and yellowish-white; the superior spinners are triarticulate, much longer than the rest, and have the spinning-tubes disposed on the inferior surface of the terminal joint; their colour and that of the intermediate spinners is red-brown, and the inferior ones are black; a small, prominent, red-brown process is connected with the posterior margin of the sexual organs; and the branchial opercula have a yellowish-white tint.

The male, though smaller and darker than the female, resembles her in the design formed by the distribution of its colours. The cubital and radial joints of its palpi, which are short, are supplied with some long, black bristles, and the latter projects a strong,

acute apophysis from its extremity, on the outer side; the digital joint is of an oblong-oval figure, pointed at the end; it is convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, with a large and very prominent process at the base, whose extremity is crescent-shaped, and a long, finely-pointed spine originating at the base, on the inner side, and directed in a curve to the outer side; they are of a brown-black colour, tinged with red.

Professor Sundevall was the first who proposed to found upon this species the genus *Textrix*, which he defined in his 'Conspectus Arachnidum,' published in 1833; a like proposition, made in the autumn of the same year, was announced in the 'London and Edinburgh Philosophical Magazine;' and it is a remarkable coincidence that the same generic name should be conferred on this spider in both instances.

*Textrix lycosina*, which has a relation of analogy with the *Lycosidæ*, by the disposition and relative size of its eyes, is widely distributed in Great Britain, most commonly occupying crevices in rocks, stone walls, and the bark of old trees. Its snare consists of a sheet of web, supported both above and below by fine lines intersecting one another at various angles, and attached to it and to adjacent objects by their extremities; a cylindrical tube, in connexion with the snare, usually extends to the spider's retreat. The sexes pair in June, and in the following month the female deposits between fifty and sixty spherical eggs, of a pale-yellow colour, not adherent among themselves, in a lenticular cocoon of white silk, of a fine but compact texture, measuring one fourth of an inch in diameter; it is attached to stones by a small covering of white web, on the exterior surface of which particles of soil and other materials are frequently distributed.

This spider, with a change of integument, is capable of reproducing the legs, palpi, and terminal joint of the superior spinners after they have been removed by amputation.

A solitary instance of the capture of *Textrix lycosina* in Ireland is recorded by Mr. R. Templeton.

## DESCRIPTION OF PLATE I.

FIG.

1. *Atypus Sulzeri*. *a*, ♀; *b*, ♂; *c*, ♀; profile view; *d*, the same from below; *e*, eyes; *f*, portion of leg; *g*, extremity of palpus of ♀; *h*, palpus with palpal organs of ♂.
2. *Lycosa agretyca*. *a*, ♀; *b*, ♂.
3. „ *campestris*. *a*, ♀; *b*, ♂; *c*, maxillæ and labium.
4. „ *andrenivora*. *a*, ♀; *b*, ♂; *c*, cephalo-thorax and abdomen in profile; *d*, eyes; *e*, labium, maxillæ, &c.; *f*, claws with portion of leg; *g*, palpal organs of ♂.
5. „ *rapax*. *a*, ♀; *b*, ♂.
6. „ *herbigrada*. ♀.
7. „ *allodroma*. *a*, ♀; *b*, ♂.
8. „ *picta*. *a*, ♀; *b*, ♂.

To facilitate comparison, the palpal organs of the *left* side are invariably chosen for representation, and, with very few exceptions, as seen directly on the under surface. The palpal organs are nearly all given as magnified fifteen diameters.





1. *A. vilzri*, 2. *A. pygmaea*, 3. *A. concolor*, 4. *A. undulatus*, 5. *A. populi*, 6. *A. laticaudatus*, 7. *A. elongatus*, 8. *A. elongatus*.

## DESCRIPTION OF PLATE II.

FIG.

9. *Lycosa saccata*. *a*, ♀; *b*, ♂. The female is shown with a cocoon attached in the position in which she carries it about with her.
10. „ *lugubris*. *a*, ♀; *b*, ♂.
11. „ *obscura*. *a*, ♀; *b*, ♂.
12. „ *exigua*. *a*, ♀, with attached cocoon; *b*, ♂.
13. „ *fluvialis*. *a*, ♀; *b*, ♂; *c*, cocoon.
14. „ *cambrica*. *a*, ♀, with cocoon; *b*, ♂; *c*, maxillæ and labium; *d*, cocoon detached, showing suture.
15. „ *latitans*. *a*, ♀; *b*, ♂.
16. „ *piratica*. *a*, ♀; *b*, ♂.
17. „ *piscatoria*. *a*, ♀; *b*, ♂.
18. *Dolomedes mirabilis*. *a*, ♀; *b*, ♂; *c*, eyes; *d*, parts of the mouth, with sternum and palpus of ♀; *e*, outline of cephalo-thorax and abdomen, from above; *f*, palpal organs of ♂, from below; *g*, the same in profile.
19. „ *ornatus*, ♀, jun.
20. „ *fimbriatus*, ♀.

The attempt was made to give the figures on the uniform scale of enlargement of two and a half times; in these two plates all are magnified to this extent, except figs. 19 (five times) and 20 (twice), but it was found that this could not be adhered to satisfactorily, and in future plates the length of the female will be added by the side of the figure.





1. *Lycosa dolomieu*, a. 2. *Lycosa dolomieu*, b. 3. *Lycosa dolomieu*, c. 4. *Lycosa dolomieu*, d. 5. *Lycosa dolomieu*, a. 6. *Lycosa dolomieu*, b. 7. *Lycosa dolomieu*, c. 8. *Lycosa dolomieu*, d. 9. *Lycosa dolomieu*, a. 10. *Lycosa dolomieu*, b. 11. *Lycosa dolomieu*, c. 12. *Lycosa dolomieu*, d. 13. *Lycosa dolomieu*, a. 14. *Lycosa dolomieu*, b. 15. *Lycosa dolomieu*, c. 16. *Lycosa dolomieu*, d. 17. *Lycosa dolomieu*, a. 18. *Lycosa dolomieu*, b. 19. *Lycosa dolomieu*, c. 20. *Lycosa dolomieu*, d.

# DESCRIPTION OF PLATE III.

FIG.

2. Palpal organs and portion of left palpus of male *Lycosa agretyca*, as seen from below.
3.       "                               "                               "       *campestris*               "
5.       "                               "                               "       *rapax*               "
7.       "                               "                               "       *allodroma*               "
8.       "                               "                               "       *picta*               "
9.       "                               "                               "       *saccata*               "
10.      "                               "                               "       *lugubris*               "
- a*, digital joint of the same side, with palpal organs, as seen from within.
11. Papal organs and portion of left palpus of male *Lycosa obscura*, as seen from below.
12.      "                               "                               "       *exigua*               "
13.      "                               "                               "       *fluviatilis*               "
14.      "                               "                               "       *cambrica*               "
15.      "                               "                               "       *latitans*               "
16.      "                               "                               "       *piratica*               "
17.      "                               "                               "       *piscatoria*               "
21. *Hecäerge spinimana*. *a*, female; *b*, male; *c*, eyes; *d*, maxillæ and labium; *e*, claw; *f*, palp of male.
22. *Sphasus lineatus*. *a*, female; *b*, male; *c*, eyes; *d*, parts of mouth; *e*, forepart of cephalo-thorax, from the side; *f*, claw; *g*, palpal organs, &c. of male.
23. *Eresus cinnabarinus*, ♀, from a specimen in the collection at the British Museum. *a*, eyes; *b*, maxillæ and labium.
24. *Salticus scenicus*. *a*, female; *b*, male; *c*, outline profile of cephalo-thorax and abdomen; *d*, eyes; *e*, falces, maxillæ, and labium of male; *f*, outline profile of anterior part of cephalo-thorax of male, to show forward projection of the falces; *g*, foot from below, to show appearance of scopula when in action; *h*, the same from the side; *i*, palpal organs, &c. of male.
25.      "       *sparsus*. *a*, female; *b*, male; *c*, palpal organs, &c. of male.
26.      "       *coronatus*. *a*, female; *b*, male; *c*, palpal organs, &c. of male.
27.      "       *frontalis*. *a*, female; *b*, male; *c*, palpal organs, &c. of male.
28.      "       *obscurus*, male. *a*, palpal organs, &c.
29.      "       *distinctus*. *a*, female; *b*, male; *c*, palpal organs, &c. of male.
30.      "       *floricola*, male. *a*, palpal organs, &c.
31.      "       *cupreus*. *a*, female; *b*, male; *c*, palpal organs, &c. of male.
32.      "       *promptus*, immature female.
33.      "       *reticulatus*. *a*, female; *b*, male; *c*, palpal organs, &c. of male.
34.      "       *Blackwallii*, female.
35.      "       *tardigradus*, male; *a*, palpal organs, &c.
36.      "       *formicarius*, male, from a specimen in the collection of native spiders at the British Museum.





1. *Lepisa*, 2. *L. amplicornis*, 3. *L. amplicornis*, 4. *L. amplicornis*, 5. *L. amplicornis*, 6. *L. amplicornis*, 7. *L. amplicornis*, 8. *L. amplicornis*, 9. *L. amplicornis*, 10. *L. amplicornis*, 11. *L. amplicornis*, 12. *L. amplicornis*, 13. *L. amplicornis*, 14. *L. amplicornis*, 15. *L. amplicornis*, 16. *L. amplicornis*, 17. *L. amplicornis*, 18. *L. amplicornis*, 19. *L. amplicornis*, 20. *L. amplicornis*, 21. *L. amplicornis*, 22. *L. amplicornis*, 23. *L. amplicornis*, 24. *L. amplicornis*, 25. *L. amplicornis*, 26. *L. amplicornis*, 27. *L. amplicornis*, 28. *L. amplicornis*, 29. *L. amplicornis*, 30. *L. amplicornis*, 31. *L. amplicornis*, 32. *L. amplicornis*, 33. *L. amplicornis*, 34. *L. amplicornis*, 35. *L. amplicornis*, 36. *L. amplicornis*.

# DESCRIPTION OF PLATE IV.

FIG.

37. *Thomisus brevipes*, ♀.
38. „ *cristatus*. *a*, ♀; *b*, ♂; *c*, eyes; *d*, maxillæ and lip; *e*, lateral view of cephalo-thorax and abdomen, in outline; *f*, claw of anterior leg; *g*, claw of palpus; *h*, male palpal organs.
39. „ *audax*, ♀.
40. „ *erraticus*, ♂; *a*, palpal organs.
41. „ *sabulosus*. *a*, ♀, immature; *b*, ♂; *c*, palpal organs of ditto.
42. „ *atomarius*, ♀, from a specimen in the collection of indigenous spiders at the British Museum.
43. „ *cinereus*, ♀.
44. „ *floricolens*. *a*, ♀; *b*, ♂; *c*, palpal organs of ditto.
45. „ *luctuosus*, ♂; *a*, palpal organs.
46. „ *bifasciatus*. *a*, ♀; *b*, ♂; *c*, male palpal organs.
47. „ *Cambridgii*, ♀.
48. „ *pallidus*, ♀.
49. „ *versutus*. *a*, ♀; *b*, ♂; *c*, male palpal organs.
50. „ *trux*, ♂; *a*, palpal organs.
51. „ *incertus*. *a*, ♀; *b*, ♂; *c*, male palpal organs.
52. „ *claveatus*. *a*, ♀; *b*, ♂; *c*, male palpal organs.
53. „ *citreus*. *a*, ♀; *b*, ♂; *c*, ditto.
54. „ *abbreviatus*, ♀; *a*, side view of the cephalo-thorax, showing one of the projections on which the lateral eyes are seated; *b*, frontal margin.





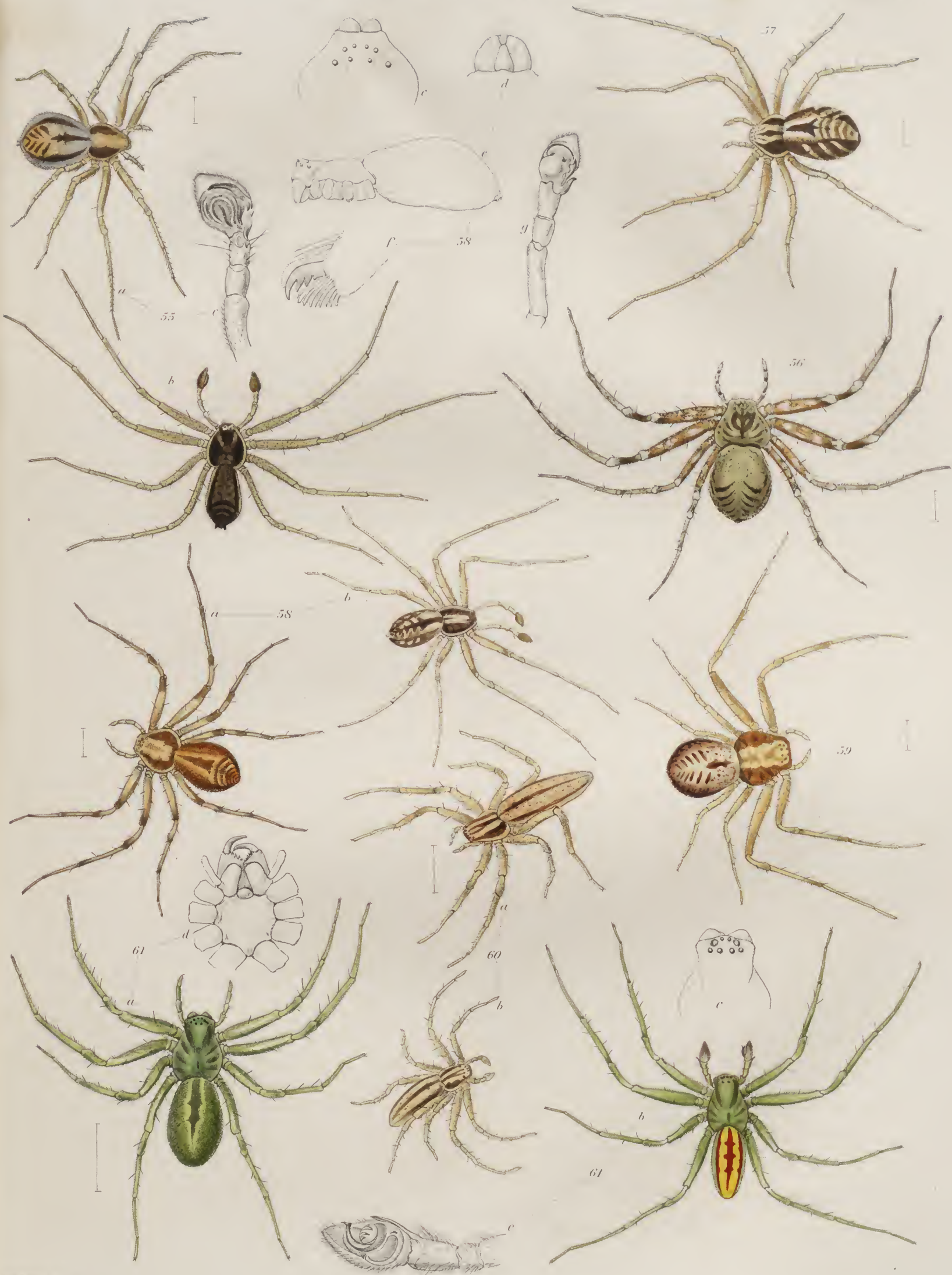
37. *Thomisus* ♂. 38. *Thomisus* ♀. 39. *Thomisus* ♂. 40. *Thomisus* ♀. 41. *Thomisus* ♂. 42. *Thomisus* ♀. 43. *Thomisus* ♂. 44. *Thomisus* ♀. 45. *Thomisus* ♂. 46. *Thomisus* ♀. 47. *Thomisus* ♂. 48. *Thomisus* ♀. 49. *Thomisus* ♂. 50. *Thomisus* ♀. 51. *Thomisus* ♂. 52. *Thomisus* ♀. 53. *Thomisus* ♂. 54. *Thomisus* ♀. 55. *Thomisus* ♂. 56. *Thomisus* ♀. 57. *Thomisus* ♂. 58. *Thomisus* ♀. 59. *Thomisus* ♂. 60. *Thomisus* ♀.



DESCRIPTION OF PLATE V.

FIG.

55. *Philodromus dispar*. *a*, ♀ ; *b*, ♂ ; *c*, palpal organs of ♂ .  
56. „ *pallidus*, ♀ .  
57. „ *elegans*, ♀ .  
58. „ *cespiticolis*. *a*, ♀ ; *b*, ♂ ; *c*, eyes ; *d*, maxillæ and labium ; *e*, cephalo-thorax and abdomen, from the side ; *f*, claw and scopula ; *g*, palpal organs of ♂ .  
59. „ *aureolus*, ♀ .  
60. „ *oblongus*. *a*, ♀ ; *b*, immature ♂ .  
61. *Sparassus smaragdulus*. *a*, ♀ ; *b*, ♂ ; *c*, eyes ; *d*, maxillæ and labium ; *e*, palpal organs of ♂ .



# DESCRIPTION OF PLATE VI.

FIG.

62. *Drassus lucifugus*, ♀.
63. „ *ater*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂; *d*, cocoons; the white one still contains eggs; from the pink-coloured one the young spiders have made their exit.
64. „ *pusillus*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂; *d*, the spine, as seen from the side.
65. „ *pumilus*, ♀.
66. „ *clavator*. *a*, immature ♀; *b*, ♂; *c*, palpal organs of ♂; *d*, digital organs, from above, to show the position of the large radial apophysis.
67. „ *cericeus*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂.
68. „ *sylvestris*, ♀.
69. „ *cupreus*. *a*, ♀; *b*, ♂; *c*, eyes; *d*, maxillæ and labium; *e*, palpal organs of ♂.
70. „ *lapidicolens*, ♂; *a*, palpal organs.
71. „ *ferrugineus*, ♀; *a*, maxillæ, labium, and palpus; *b*, eyes.
72. „ *micans*, ♂; *a*, palpal organs.
73. „ *nitens*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂.
74. „ *propinquus*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂.





62. *D. (D.) parvulus* F. 63. *D. (D.) parvulus* F. 64. *D. (D.) parvulus* F. 65. *D. (D.) parvulus* F. 66. *D. (D.) parvulus* F. 67. *D. (D.) parvulus* F. 68. *D. (D.) parvulus* F. 69. *D. (D.) parvulus* F. 70. *D. (D.) parvulus* F. 71. *D. (D.) parvulus* F. 72. *D. (D.) parvulus* F. 73. *D. (D.) parvulus* F. 74. *D. (D.) parvulus* F. 75. *D. (D.) parvulus* F.

# DESCRIPTION OF PLATE VII.

FIG.

75. *Clubiona holosericea*. *a*, ♀; *b*, ♂; *c*, eyes; *d*, maxillæ, labium, and falces; *e*, profile of cephalo-thorax and abdomen; *f*, palpal organs of ♂.
76. „ *amarantha*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂.
77. „ *epimelas*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂, from below.
78. „ *formosa*, ♀; *a*, eyes of the same.
79. „ *corticalis*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂, from below; *d*, the same in profile, as seen from the inner side; *e*, extremity of radial joint of the same palpus, from without.
80. „ *brevipes*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂, from below; *d*, *e*, as in the last figure.
81. „ *comta*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂.





75. *C. holosericea*, ♀, ♂. 76. *C. amarantha*, ♀, ♂. 77. *C. spinosa*, ♀, ♂. 78. *C. dimidiata*, ♀, ♂. 79. *C. longicauda*, ♀, ♂. 80. *C. brevipes*, ♀, ♂. 81. *C. canthi*, ♀, ♂.

DESCRIPTION OF PLATE VIII.

FIG.

82. *Clubiona pallens*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂.

83. „ *accentuata*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂, from below; *d*, radial joint from the outer side.

84. „ *domestica*, ♀, jun.

85. „ *nutrix*, ♂; *a*, palpus, with palpal organs of ♂; under surface; *b*, lateral view of the radial and digital joints, with the palpal organs.

86. „ *erratica*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂.

87. *Argyroneta aquatica*. *a*, ♀; *b*, ♂; *c*, eyes; *d*, maxillæ, labium, and falces (the long hairs, with which these parts are profusely covered, are omitted); *e*, palpal organs of ♂; *f*, the same, from the inner side; *g*, cocoon, from above; *h*, the same in profile.





82. *C. affinis*, ♂. 83. *C. accentuata*, ♂. 84. *C. domstica*, ♀ juv. 85. *C. natrix*, ♂. 86. *C. corrutia*, ♀. 87. *A. aquatica*, ♀. ♂.

# DESCRIPTION OF PLATE IX.

FIG.

88. *Ciniflo atrox*. *a*, ♀; *b*, ♂; *c*, eyes; *d*, maxillæ, labium, and falces; *e*, spinners; *f*, palpal organs of ♂; *g*, the same in profile; *h*, hind leg, showing the calamistrum; *i*, calamistrum more enlarged.
89. „ *similis*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂; *d*, the same in profile.
90. „ *ferox*. *a*, ♀; *b*, ♂; *c*, ♀, a very dark variety; *d*, palpal organs of ♂; *e*, upper surface of radial and digital joints; *f*, the same in profile, from the outer side.
91. „ *mordax*, ♀.
92. „ *humilis*, ♀.
93. *Ergatis benigna*. *a*, ♀; *b*, ♂; *c*, eyes; *d*, parts of the mouth; *e*, cephalo-thorax and falces of male, in profile; *f*, spinners; *g*, palpus of ♂; *h*, palpal organs in profile; *i*, cocoons, slightly enlarged, attached to *Carex cæspitosa*.
95. „ *latens*. *a*, ♀; *b*, ♂; *c*, cocoons attached to calluna.







# DESCRIPTION OF PLATE X.

## FIG.

94. *Ergatis pallens*, ♀.
96. *Veleda lineata*, ♀, jun. *a*, eyes; *b*, parts of the mouth.
97. *Agelena labyrinthica*. *a*, ♀; *b*, ♂; *c*, eyes; *d*, maxillæ and labium; *e*, palpal organs of ♂; *f*, spinners; *g*, superior spinner in profile.
98. „ *Hyndmanii*, ♀; *a*, eyes.
99. „ *elegans*. *a*, ♀; *b*, ♂; *c*, palpus of male, from the side; *d*, palpal organs, from below; *e*, spinners.
100. „ *montana*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂.
101. „ *nava*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂.
102. „ *brunnea*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂.
103. „ *celans*, ♀.
104. „ *gracilipes*, ♂; *a*, palpal organs.



94. *E. pallidus*, ♀. 96. *V. lineata*, ♀, juv. 97. *A. labyrinthica*, ♀, ♂. 98. *A. hindmarnia*, ♀. 99. *A. arguta*, ♀, ♂.  
100. *A. montana*, ♀, ♂. 101. *A. nana*, ♀, ♂. 102. *A. brunnea*, ♀, ♂. 103. *A. flava*, ♀. 104. *A. gracilis*, ♀, ♂.



DESCRIPTION OF PLATE XI.

FIG.

105. *Tegenaria domestica*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂; *d*, the same in profile.

106. „ *atrica*. *a*, ♀; *b*, ♂; *c*, palpal organs of ♂; *d*, the same in profile; *e*, spine enlarged; *f*, portion of the same, still more magnified; *g*, compound sessile hair; *h*, portion of integument of leg, showing sockets of the hairs and spines.

24 K. *Salpicus scenicus*, hair from a scopula, much enlarged.

69 F. *Drassus cupreus*. papillæform hair from the tarsus, highly magnified.





Tuffen West. sc. ad nat.

105. *T. domestica*, ♀, ♂. 106. *T. atrica*, ♀, ♂.

W. West, imp.

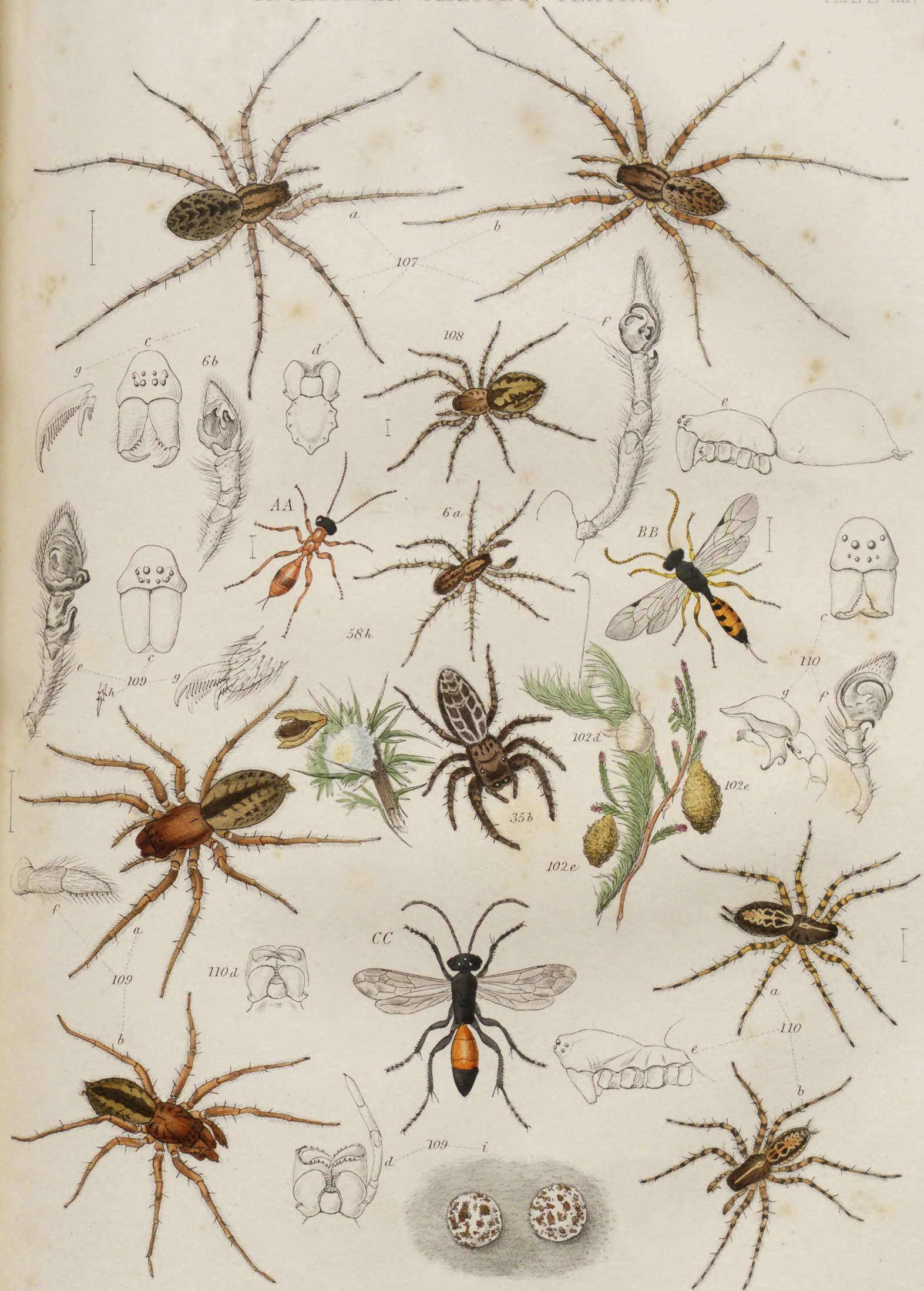


## DESCRIPTION OF PLATE XII.

FIG.

107. *Tegenaria civilis*. *a*, ♀; *b*, ♂; *c*, eyes and falces; *d*, maxillæ, labium, and sternum; *e*, cephalo-thorax and abdomen, in profile; *f*, palpus of ♂; *g*, claws.
108. „ *silvicola*, ♀.
109. *Cælotes saxatilis*. *a*, ♀; *b*, ♂; *c*, eyes and falces; *d*, parts of the mouth; *e*, palpus of ♂; *f*, lateral view of spinners; *g*, claws; - *h*, cocoons, of the natural size, with particles of earth deposited by the spider on the upper surface.
110. *Tetrrix lycosina*. *a*, ♀; *b*, ♂; *c*, eyes and falces; *d*, parts of the mouth; *e*, cephalo-thorax with falx, profile view; *f*, palpus of ♂; *g*, palpal organs in profile.
6. *Lycosa herbigrada*. *a*, ♂; *b*, palpal organs of ditto.
35. *Salticus tardigradus*. *b*, ♀.
58. *Philodromus cespiticolis*. *h*, cocoon in situ on calluna, slightly enlarged.
102. *Agelena brunnea*. *d*, cocoon, attached to moss, in its unfinished state, previous to its being plastered with mud, as shown in Fig. *e*, slightly enlarged.
- AA. *Hemeteles fasciatus*, wingless ♀; a figure of the male will be given in a subsequent Plate.
- BB. „ *formosus*. Desv. These two ichneumons are parasites of *Agelena brunnea*. They are described by Mr. F. Smith, in the ‘Transactions of the Entomological Society,’ for the year 1860.
- CC. *Pompilus sepicola*. F. Smith. (*P. fuscus*. Fabr., not of Linn.) A large ichneumon, which, after paralysing spiders by piercing them with its ovipositor, conveys them to its nidus as food for its young.





Tufin West. sc. ad nat.

W. West. imp.

107. *Ta. civilis*, ♀, ♂. 108. *Ta. silvicola*, ♀. 109. *C. saxatilis*, ♀, ♂. 110. *Tx. lycosina*, ♀, ♂.  
 AA. *Pezomachus fasciatus*. BB. *Hemiteles formosus*. CC. *Pomphilus sepicola*.